NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT

Permit Number: MD0068357

2015 Annual Report

Submitted to:

State of Maryland
Department of the Environment
1800 Washington Blvd.
4th Floor, STE 440 Baltimore,
Maryland 21230-1708

Submitted by:

Frederick County
Community Development Division
30 North Market Street
Frederick, Maryland 21701

December 30, 2015

Executive Summary

The submission of this annual progress report to the Maryland Department of Environment (MDE) fulfills requirements specified under the Frederick County National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. 11-DP-3321, MD0068357. This will be the County's first report on meeting the requirements under the new third-generation Phase I NPDES MS4 permit, which went into effect December 30, 2014. Unlike previous annual reporting periods which cover an entire fiscal year (July 1 – June 30 of the permit year), this report will cover programs in effect for the timeframe of January 1, 2015 – June 30, 2015. Since the County's new permit was issued December 2014, rather than waiting an additional six months and submitting a report that covers 18 months of County programs and progress, the County is submitting its first report covering six months in order to get back on the July 1 – June 30 schedule.

Continuing progress has been made in the County's NPDES programs since the 2014 Annual Report was submitted in 2015. The sections in this annual report follow specific sections presented under Part IV, Standard Permit Conditions, of the County's NPDES Permit to document how required elements of the County's stormwater program are being implemented.

Frederick County filed a Petition for Judicial Review on its MS4 permit, which is currently in Frederick Circuit Court, case number 10-C-15-000293. A Joint Motion for Extend Stay of Proceedings was granted on September 18, 2015 that included a stay of proceedings until June 30, 2016, the requirement for a joint notice informing the court of the status of the matter by this date, a stay of the County's deadline for submittal of restoration plans pursuant to section IV.E.2.b until this date, and the requirement to determine if the negotiations have reached an impasse by March 31, 2016. The Chesapeake Bay Foundation also filed a Petition for Judicial Review on Frederick County's permit issuance, currently in Frederick County Circuit Court, case number 10-C-15-000259. This case is stayed until December 15, 2015. A Joint Status Report was filed on December 15, 2015.

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List of Acronyms

AFF	Alice Ferguson Foundation
BayFAST	Bay Facility Assessment Scenario Tool
BMP	Best Management Practices
CBP	Chesapeake Bay Program
CCB	Coal Combustion Byproducts
CWP	Center for Watershed Protection
CY	Calendar Year
DEL	Delivered
DPR	Division of Parks and Recreation
DPW	Division of Public Works
DUSWM	Division of Utilities and Solid Waste Management
ECS	Environmental Compliance Section
EOS	Edge of Stream
EPA	United States Environmental Protection Agency
ESD	Environmental Site Design
FCSS	Frederick County Stream Survey
FY	Fiscal Year
HSI	Hotspot Site Investigation
IDDE	Illicit Connection Detection and Enforcement
IIT	Interagency Information Technologies
LULC	Land use / Land cover
MAST	Maryland Assessment Scenario Tool
MCWA	Monocacy & Catoctin Watershed Alliance
MDE	Maryland Department of the Environment
MDP	Maryland Department of Planning
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
RPC	Responsible Personnel Certification
SCA	Stream Corridor Assessment
SCD	Soil Conservation District
SW to MEP	Stormwater to the Maximum Extent Practicable
SWPPP	Stormwater Pollution Prevention Plans
SW-WLA	Stormwater Wasteload Allocation
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey
WLA	Wasteload Allocation
WRAS	Watershed Restoration Action Strategy

1 Introduction

The submission of this annual progress report to the Maryland Department of Environment (MDE) fulfills requirements specified under the Frederick County National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. 11-DP-3321, MD0068357. This will be the County's first report on meeting the requirements under the new third-generation Phase I NPDES MS4 permit, which went into effect December 30, 2014. Unlike previous annual reporting periods which cover an entire fiscal year (July 1 – June 30 of the permit year), this report will cover programs in effect for the timeframe of January 1, 2015 – June 30, 2015. Since the County's new permit was issued December 2014, rather than waiting an additional six months and submitting a report that covers 18 months of County programs and progress, the County is submitting its first report covering six months in order to get back on the July 1 – June 30 schedule.

The County continues to excel in stormwater management, long-term watershed monitoring, restoration and retrofit implementation, developing Geographic Information System (GIS) data, and conducting public outreach activities in accordance with the requirements of the permit. NPDES funding remains adequate to meet the conditions of the permit.

The sections in this annual report follow specific sections presented under Part IV, Standard Permit Conditions, of the County's NPDES Permit to document how required elements of the County's stormwater program are being implemented. An introduction to the document is presented in Section 1. Section 2, Permit Administration, provides names, functions, and contact information for all primary administrative and technical personnel and liaisons responsible for permit compliance, as well as an organizational chart. Section 3, Legal Authority, documents the recertification from the County Attorney that the County possesses the authority to perform NPDES-related activities. Section 4, Source Identification, presents an update on the County's efforts in updating both their GIS data library and their database for tracking new and existing stormwater management facilities, along with a table detailing the status of important GIS datasets. In Section 5, Management Programs, the County presents progress summaries and updates of several permit management activities, such as erosion and sediment control, illicit discharge detection, spill response, litter and floatables, road maintenance, pesticide/herbicide use, and public outreach. Section 6, Watershed Assessment and Restoration, presents progress of the County's watershed assessments, restoration projects by type, outlines the County's approach towards completing required restoration towards Total Maximum Daily Load (TMDL) requirements and impervious area reduction, and includes the County's strategy for public participation throughout the development of its watershed assessments and restoration plans. Section 7, Assessment of Controls, discusses monitoring activities, including the County's long-term physical, chemical, and biological monitoring program at Peter Pan Run and at a land use-specific Best Management Practice (BMP) outfall. Results of this program, along with pollutant load estimates, biological and physical assessment data, and other related information are presented as an appendix to the report. Section 8 covers program funding. In Section 9, Special Programmatic Conditions, the County reports on activities undertaken in working toward meeting the Chesapeake Bay TMDL and offers a brief status summary of the Water Resources Element.

Unlike previous reports, this will be a data-driven report with the majority of program information included in the accompanying database or as appendices to the main document.

Fourteen (14) appendices have been included in this document. Contents of all appendices are also available on the CD, either in Microsoft Word, Microsoft Excel, PDF, or database format.

All sections of the document have been reproduced electronically and can be found on the accompanying CD.

2 Permit Administration

The following Frederick County personnel are responsible for the various program components that support compliance with the County's NPDES MS4 permit.

The Watershed Management Section (WMS), which manages the County's NPDES permit, is a part of the Office of Sustainability and Environmental Resources (OSER) within the Community Development Division (CDD). Staff and their responsibilities related to NPDES permit administration are listed below.

In addition to staff within CDD, WMS staff also works with a variety of staff from the Division of Utilities and Solid Waste Management (DUSWM), the Division of Public Works (DPW), the Division of Parks and Recreation (DPR), and the Interagency Information Technologies (IIT) Division.

Community Development Division (CDD) – 30 N. Market St., Frederick, MD 21701

- Shannon Moore, Manager, Office of Sustainability and Environmental Resources 301.600.1413
  Manages budgets for operating funds, program staff Darlene Bucciero, Heather Montgomery Dutra, Jeff Feaga, and Suzanne Cliber.

- Steven C. Horn, Acting Division Director, Community Development Division 301.600.1153
  Controls budgets and ensures County management adequately supports permit. Provides additional oversight for permit management.

- Darlene Bucciero, Project Manager IV 301.600.2952
  Supports NPDES activities, manages NPDES-related Capital Improvement Project development and implementation.

- Heather Montgomery Dutra, Project Manager III 301.600.1741
  Supports NPDES activities, manages NPDES-related operating projects and implementation.

- Jeff Feaga, Ph.D., Community Restoration Coordinator 301.600.1350
  Coordinates watershed restoration efforts related to grants.

- Suzanne Cliber, Green Homes Challenge Coordinator 301.600.7414
  Coordinates watershed restoration efforts related to grants.

- Rick Masser, Chief Environmental Inspector, Environmental Compliance Section 301.600.3507
  Manages Sediment and Erosion Control Program. Supervises collection of information for permit that includes grading permits and stormwater facility maintenance inspections.

- Dave Crable, Project Manager IV, Department of Development Review 301.600.1137
  Maintains database of stormwater management facilities and reviews stormwater management development plans.

- Tim Goodfellow, Principal Planner II, Comprehensive Planning 301.600.2508
  Coordinates planning activities related to the NPDES permit.

Permit information is included in the related table PermitInfo of the MDE_NPDES_MS4 geodatabase.

3 Legal Authority

Appendix A includes a letter from Assistant County Attorney Kathy Mitchell certifying that the County has the legal authority to meet the requirements of its permit.

4 Source Identification

This section documents permit-required efforts under Parts IV.C. 1 through 6. Frederick County has collected source identification data on all permit-required topics. The County has a centralized County GIS office within the IIT Division. This approach includes centralized functions such as the development and maintenance of core data layers, development of data standards, system administration, and general oversight of GIS activities countywide. Frederick County GIS distributes countywide base maps and Orthophotography. In addition, Frederick County GIS offers a free GIS data download service that includes GIS Base Data, Orthophotography, Contour-Planimetric Data, and Parcel Data. This service can be found at http://www.frederickcountymd.gov/5450/GIS-Data-Products under “Download GIS Data”.

The Frederick County GIS office continually progresses in enhancing the County’s GIS capabilities and in compiling source identification data.

4.1 Storm Drain System

The County currently maintains a Stormwater System database which includes data for stormwater inventory records for all infrastructure including culverts, storm drains, structures, ditches, outfalls, and ponds. Storm drain system data is contained within the OUTFALL feature class (964 records) and includes related drainage areas, and other related tables. Major attributes that are captured in these tables include IDs, structure characteristics, status, owner, and general comments. In addition to the required feature classes, Frederick County maintains a storm drain and structure inventory which includes pipes (14,082 records), pond outlines (397 records), and structures (14,051 records).

4.2 Industrial and Commercial Sources

A list of the total number of industrial and commercial facilities that the County has determined may have the potential to contribute significant pollutants is included in Appendix B. Information provided in this appendix includes: facility name, company, address, city, state, zip code, NAICs code, and facility description.

4.3 Urban Best Management Practices

At present, Urban Best Management Practices are included in the MDE_NPDES_MS4 geodatabase. Records for stormwater facilities will be included in BMPPOI feature class and includes associated drainage areas and other related tables. Major attributes that are captured in these tables include structure ID, BMP type, BMP description, and acres treated. New facilities are entered into the database upon approval of the as-built survey.

4.4 Impervious Surfaces

The MS4 boundary and impervious surfaces have been compiled for Frederick County. Impervious data are included in the MDE_NPDES_MS4 geodatabase table, ImperviousSurface (1 record).

4.5 Monitoring Locations

The County maintains and updates, as needed, an inventory of biological and chemical monitoring sites. These data are included in the following tables in the MDE_NPDES_MS4 geodatabase: BiologicalMonitoring (10 records), ChemicalMonitoring (30 records), LocalConcern (0 records), MonitoringSite (16 records), and MonitoringDrainageArea (16 records). Major features that are captured in these tables include site ID, even date and time, assessment results (e.g., BIBI/FIBI, habitat scores, water quality measurements), monitoring drainage area, and general comments.

4.6 Water Quality Improvement Projects

Water Quality Improvement Projects commenced within the reporting timeframe of 01/01/15 through 06/30/15 are listed below. These projects are also included in Appendix C including information on project description and status.

- Urbana Pond Retrofits
- Hunting Creek Upper / Lower Mainstem Drainage Study
- Ballenger Creek Stormwater Master Plan
- County owned Property Retrofit Assessment
- Open Section Road Assessment
- Upper Monocacy Watershed Assessment
- Lower Monocacy Watershed Assessment
- Double Pipe Creek Watershed Assessment
- Potomac River Watershed Assessment
- Catoctin Creek Watershed Assessment
- Englandtowne Stormwater Pond Retrofit
- Point of Rocks Stream Restoration
- Point of Rocks Pond Retrofit
- County-owned Stormwater Facility Retrofits

5 Management Programs

This section documents permit-required efforts under Parts IV.D. 1 through 6. Frederick County continually evaluates its stormwater management programs in an effort to identify and bring about needed improvements as required under its NPDES permit. The County continues to evaluate their progress and effectiveness to control stormwater discharges to the maximum extent practicable (MEP). Current program components, improvements made during the timeframe covered in this report, and plans for future activities, particularly as the County continues to implement management programs under its new permit, are discussed below.

5.1 Stormwater Management Programs

Frederick County maintains its current Stormwater Management Program in compliance with Environmental Article, Title 4, Subtitle 2, Annotated Code of Maryland. The County will continue to do so

through plan review and inspection of all developer projects and through implementation of the 2000 Maryland Stormwater Design Manual (Effective October 2000, Revised May 2009; MDE 2000) and the Stormwater Act of 2007.

5.1.1 Maintenance Inspections of Stormwater Management Facilities

The Department of Permits and Inspections, Environmental Compliance Section (ECS) conducts a program of preventative maintenance inspections of those constructed and functioning stormwater management facilities located within Frederick County and most of its municipalities. Excluded from ECS jurisdiction are those facilities located within Frederick City and those within the municipal boundaries of Mount Airy. As required under the County's MS4 permit, the County conducts these inspections on a sequential basis of once within a year after the as-built drawing approval and then on a triennial basis thereon in perpetuity.

Responsible parties of noncompliant facilities receive notices that outline the failings observed by the inspector, what has to be completed to correct the failings and a timeframe in which the corrections should be completed. Appropriate follow-up inspections and escalating enforcement techniques, as necessary, are completed until compliance is obtained.

For the first half of CY2015, Frederick County's Urban BMP database had 994 individually identified structures. The following inspections were completed during January 1, 2015 through June 30, 2015:

- Number of inspections completed: 182
- Number of initial inspections: 115
- Number of 2015 BMPs FAILING inspection: 7
- Number of 2015 BMPs FAILING the initial inspection but subsequently PASSING: 4
- Number of 2015 BMPs FAILING the initial inspection and are still currently FAILING: 7
- Number of 2015 FAILING BMPs to be carried over to the second half of CY2015: 7
- Number of 2014 Failing BMPs that failed and have yet to be resolved: 5
- Number of 2014 Failing BMPs that passed follow-up inspections performed during this time frame: 30
- Number of facilities with an out-of-date inspection (to be remedied in the first half of CY2016): 11
- Number of facilities with no inspection: 14
    - 3 facilities were not able to be located in the field
    - 11 facilities were active, but are currently being developed

All triennial inspections are recorded within a proprietary Permitting and Development Review application Hanson Information Technologies v7.7. The appropriate data is exported from the database using select and parameter queries from an outside data management software. The subsequent data is then imported into an Excel spreadsheet and edited for presentation (see Appendix D).

Inspection data stored in the BMPInspections table (1033 records) represents all triennial inspections for the stormwater management program, including those outside the reporting term.

5.1.2 Implementation and Updates of 2000 Maryland Stormwater Design Manual

Frederick County implemented the stormwater management design policies, principles, methods, and practices of the 2000 Maryland Stormwater Design Manual and subsequent changes to the Code of Maryland Regulations through the County's Stormwater Management Ordinance and its Design Manual, on June 5, 2001. It became effective July 1, 2001. The Ordinance amended the stormwater management regulations to adopt the 2000 Maryland Stormwater Design Manual Volumes I and II. The Board of County Commissioners adopted the County's Storm Drainage and Stormwater Management Design Manual

effective January 2, 2003. This document helps address safe conveyance of runoff in channels, pipes, swales, culverts, etc. to stormwater management facilities and/or receiving channels.

The most significant improvements to the County's implementation of the MD2000 design guidelines continues to be related to the participation with MDE in establishing the necessary changes in law and design guidelines to meet the Stormwater Act of 2007. Frederick County adopted the Stormwater Act of 2007 on May 4, 2010, and is committed to working with the development community and the State to improve the implementation of these regulations and to achieve the best product for moving forward with the environmental site design implementation in an efficient manner.

Frederick County participates in workgroups, public meetings, design evaluations, and other steps involved in administering the stormwater management regulations and design guidelines. These discussions have also been used to assist staff in their evaluation of design approaches that are submitted for review in accordance with the MD 2000 design guidelines.

Evaluation: The County continues to maintain its stormwater management program in accordance with State stormwater management laws. This includes implementation of appropriate County ordinances. The County remains committed to implementing the latest stormwater management technologies while addressing the concerns of the development community. In the first half of CY2015, the ECS completed 182 triennial inspections on 158 Stormwater Management Facilities. In addition, the County continues to work with the development community and the Maryland Department of Environment to better understand the goals of the 2000 Maryland Stormwater Design Manual and the objectives of the changes associated with the Stormwater Act of 2007. The County will also continue to educate both the development community and the general public about how to determine the proper type of design for site- specific areas, as well as about facility installation timetables and maintenance issues. Staff will continue to work to address SWM earlier in the process to achieve the best product at the end of the process, as required by the changes associated with the Stormwater Act of 2007.

Inspection data are also included in the MDE_NPDES_MS4 geodatabase table: BMPInspections (1033 records) which includes information on inspection type, status, and inspection date.

5.2 Erosion and Sediment Control

Frederick County's Erosion and Sediment Control Program is administered by the Department of Permits and Inspections, Environmental Compliance Section (ECS). ECS utilizes inspectors that are specifically knowledgeable in Environmental Compliance inspection and enforcement in order to maintain an acceptable Erosion and Sediment Control Program in accordance with Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland. The County's program was evaluated by MDE during the winter of 2013 and the result of the evaluation was a full two- year renewal with a new delegation expected by the end of the calendar year 2015.

ECS continues to receive budgetary support for equipment and automation, such as:

- Four-wheel-drive (4WD) vehicles,
- Full mobile connectivity through use of Panasonic "Toughbook" laptop computers,
- Military style mobile telephones with 5 megapixel cameras built in, and
- Hands-free devices are also provided for in-vehicle use.

Continued program enhancements include:

- Community Development Division (CDD) engineering and inspection staff works closely with the local Soil Conservation Districts (SCDs) to conduct a joint approach to sediment control and stormwater management plan review. The mutual efforts to obtain Environmental Site Design to the Maximum Extent Practicable (ESD to the MEP) should prove successful in producing better designed plans.
- CDD, and the County in general, are striving to improve relationships with builders, developers and related professionals by providing an open and interactive process in which every opportunity is given to receive input on ways to improve or enhance programs.
- The Chief Environmental Inspector attends weekly meetings with the Permits and Inspections (P&I) Director, Permits Services Manager, and fellow Chief Inspectors of other disciplines. This interaction provides input and feedback from all parties and has proven to be extremely helpful and beneficial.
- Frederick County continues its support in meeting the needs of the state and the expectations of its citizenry to be environmentally sensitive and proactively protective of our natural resources.

Erosion and sediment control data are included in the MDE_NPDES_MS4 geodatabase. Some related tables include ErosionSedimentControl (162 Issues Permits) and QuarterlyGradingPermits (21 records). Major features that are captured in these tables include ID, contact information, permits issued/active, number of inspections, number of fines, number of violations, and general comments.

5.2.1 Responsible Personnel Certification Classes

Beginning in 2011, Frederick County instituted an on-line version of the Responsible Personnel Certification (RPC) training whereby an interested party may view the presentation and take the test. The test could be returned either electronically or by hardcopy and upon receipt of the testing fee ($25.00), the applicants who receive a passing score are mailed a “Greencard”. The County had great success with this process and it attracted a lot of interest, even to the point of providing training to MDE staff.

MDE implemented its own web based RPC training class in 2014 and subsequently asked the County to discontinue the use of its website. All would-be applicants have been forwarded to MDE.

Assurance is obtained as follows:

- Every SCD approved plan has a signed Owners/Developers Certification that states, (paraphrased) any responsible personnel involved with the construction of this project will have a certificate of attendance from MDE for the control of sediment and erosion.

- At every pre-construction meeting, we require the name and signature of the responsible party to whom inspections reports are to be delivered. This person is the RPC card holder.

In cases where new or unfamiliar personnel is involved, or if it is apparent that a person is not familiar with the proper application of E&S controls, inspectors ask to see cards. If they cannot provide a card, then personnel with a valid card must be present onsite during construction.

On December 19, 2015, Dela Dewa confirmed that the RespPersonnelCertInfor table reporting requirement is eliminated:

From: Mary Dewa -MDE- [mailto:mary.dewa@maryland.gov]
Sent: Wednesday, December 09, 2015 1:46 PM
To: Moore, Shannon
Cc: Dustin Henry; Maria Warburton -MDE-
Subject: Re: FW: Responsible Personnel certification MS4 requirement- question

Hi Shannon,

You are correct. The RespPersonnelCertInfo Table will be eliminated. You are not required to fill that table in the geodatabase or provide the information as Table J.

Let me know if you have any additional questions.

Regards,

Dela

Mary Dela Dewa
Regulatory and Compliance Engineer
Sediment, Stormwater & Dam Safety Program
Water Management Administration
Maryland Department of the Environment
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Baltimore, MD 21230
Office: 410-537-3753
Fax: 410-537-3553

5.2.2 Construction Site Data

Frederick County ECS provides quarterly reports of all grading activities disturbing more than one acre to MDE to cross reference against their NOI records. The data submitted includes site name, site owner and address, the amount of disturbed area, the local grading permit number, site location, and the type of development (e.g., residential, commercial, etc.).

Evaluation: Frederick County's Erosion and Sediment Control program is well established and is constantly striving for improvement. The County's goal is to establish itself as a model for which the State, other delegated jurisdictions, and its citizens may be proud. Frederick County continues to work closely and cooperatively with the local SCD. The cooperative nature of that relationship has resulted in several policy discussions designed to improve and enhance the sediment control program. Through its quarterly reports, the County met requirements for the electronic reporting of earth disturbances in the period of 1/1/2015 to 6/30/2015.

5.3 Illicit Connection Detection and Enforcement Program

Frederick County continues to implement its Illicit Connection Detection and Enforcement (IDDE) Program. The County's IDDE Program identifies potential illicit discharges in three ways: (1) through dry weather screenings completed during as-built inspections and/or triennial maintenance inspections; (2) visual surveys; and, (3) through citizen and/or agency reporting. A complete report of Frederick County's illicit discharge detection and elimination program from January to June 2015 including screen methods and results is included as Appendix E.

5.3.1 Outfall Field Screening

ECS field inspectors note evidence of dry weather flows, if present, at all Stormwater Management Structure "As-Built" inspections and at every triennial maintenance inspection. If water is present, inspectors report this information to the County's Office of Sustainability and Environmental Resources (OSER), Watershed Management Section (WMS) within 24 hours of the original inspection. WMS then checks to see if the site has been previously investigated for an illicit discharge due to dry weather flow. If it has not, or if it has but other indicators like color, odor or suds present, OSER sends an investigation request to Versar, Inc., the consultant on contract to conduct IDDE screenings. If water quality test results or inspections indicate potential illicit connections, pollutant sources are identified and appropriate measures are taken to abate violations. In addition, ECS Inspectors investigate complaints alleging violations. Follow-up actions to resolve all suspected water quality problems are documented in the County's field inspection databases. Field screening results are recorded in the County's facilities database to ensure proper tracking and to follow up when potential problems are detected.

During the first half of CY2015, the County conducted 141 dry weather screening inspections. Of the 141 screenings completed, five had dry weather flow which were delivered to OSER/ WMS for additional investigation. All five cases of dry weather flow were investigated by Versar. One of the facilities (ID 657) had been screened previously for illicit discharge and therefore was not referred to Versar for testing. Summaries of Versar screenings are included in Appendix E. In addition, IDDE data are also included in the IDDE table (7 records) in the MDE_NPDES_MS4 geodatabase.

5.3.2 Visual Surveys

As part of the IDDE program, there is a new requirement to conduct annual visual surveys of commercial and industrial areas for discovering, documenting, and eliminating pollutant sources. Included in this section are methods and results that the county used to survey industrial and commercial sites included in Figure 1.

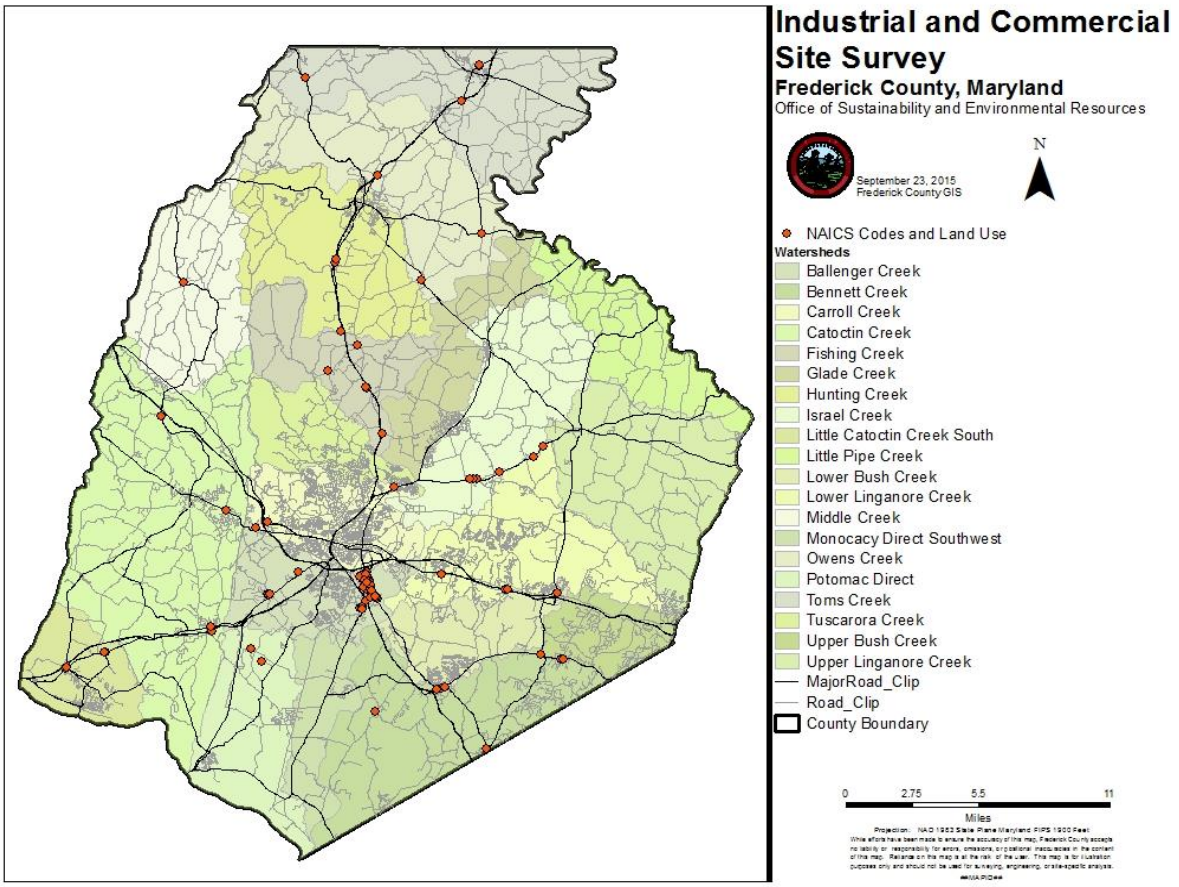

Figure 1 - Commercial and Industrial Visual Inspections

5.3.2.1 Methods

Staff conducted a program review of other MS4 jurisdictions to review best practices. The programs surveyed were in the following jurisdictions:

- Carroll County
- Charles County
- Harford County
- Howard County
- Anne Arundel county
- Baltimore City
- Baltimore County
- Montgomery County
- Prince Georges County

Staff also reviewed the "Dry Weather and MS4 Analytical and Field Screening Monitoring Procedures Manual, Watershed Protection Program (2010)" from San Diego County, California and IDDE materials from the Center for Watershed Protection.

In order to determine which industrial and commercial sites the County should prioritize as part of the survey, criteria from GIS data was used to select sites that might have the greatest risk for contributing pollution to local waterways. Zoning and land use formed the baseline data from which sites would be extracted. Only sites that were within the County's boundaries and jurisdiction and not already permitted were selected in the first phase of prioritization in order to find unregulated properties - a total of 1,430 industrial and commercial sites. In a separate step, 840 sites were selected from the layer containing the information for businesses from 2013 classified by the North American Industrial Classification System (NAICS) under or related to: repair or maintenance, manufacturing, construction, farming, and restaurants – the most common commercial and industrial industries. The 1430 sites from the first phase were queried with the 840 sites from the NAICS step to find all properties that are: 1) within County boundaries and jurisdiction, 2) non-permitted, and 3) related to aforementioned NAICS codes. A final number of 119 industrial and commercial facilities were identified as priority sites for the survey per the described criteria (Appendix B for site list). A mapbook of all 119 companies, containing an aerial map of each site (Figure 2), was created to be included in the survey process.

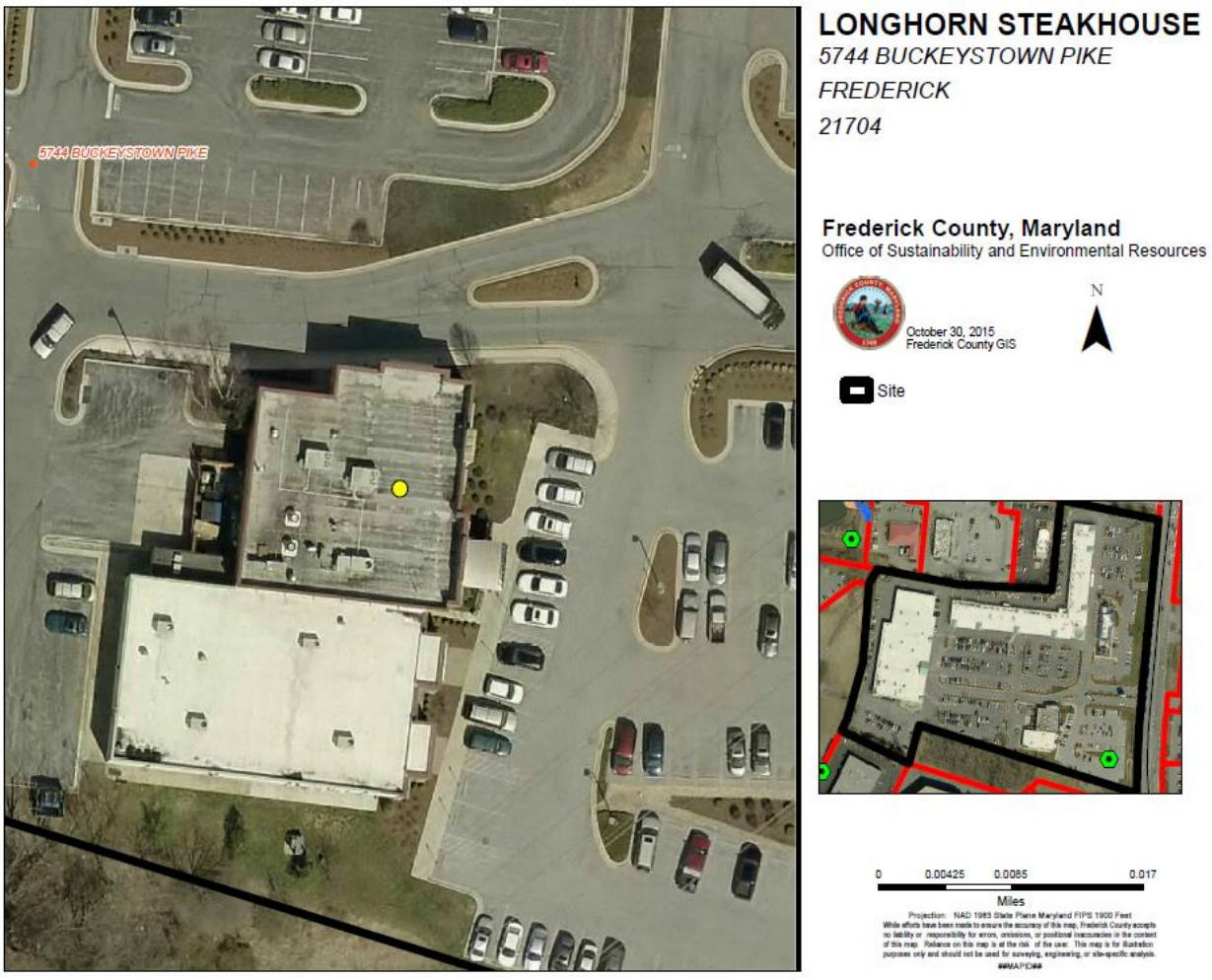

Figure 2 - Sample Image of Mapbook Page

Each site was inspected and documented via a modified form of the Center for Watershed Protection's (CWP) Hotspot Site Investigation (HSI) sheet, as provided by and used by Baltimore County. This modified

form, HSI JR., can be found in Appendix F. The modified form targets the first five characteristics, Site data; Vehicle Operations; Outdoor Materials; Waste Management; and Facility, covered by the original HSI sheet. The first five sections are most directly attributable to commercial and industrial pollution sources. One change was made by staff to the HSI Jr. form to use the original values in the CWP HSI form for determining hotspot status.

A "windshield" survey was performed by staff – by car and by foot –investigating the perimeter and publically-accessible areas of the property. To aid in completing the survey, a field packet was brought on site by staff containing, a modified Hotspot Site Investigation sheet, a letter of survey intent, and a poster illustrating proper housekeeping practices for the appropriate industry. Prior to the start of the survey, the letter of survey intent and the poster for the appropriate industry were distributed to either the business owner or the manager on duty. Representative photos of the site were also taken in order to document any observed, potential, or suspected illicit discharges. Finally, any stormwater drains or BMPs were noted on the aerial map of the business.

5.3.2.2 Results

Surveys were conducted at 24 out of the 119 sites, a fifth of the total number of properties to be visited throughout the 5-year permit. The surveys were split between four days, October 22, October 23, October 29, 2015, and November, 6, 2015. Twelve sites were inspected on October 22, 2015, 10 sites were inspected on October 23, 2015, Blues BBQ Co was visited on October 29, 2015, and Aamco Transmissions was visited on November 6, 2015 (Table 1). All 24 sites were chosen by location to allow for the most efficiency. Eleven out of the 24 can be considered potential hotspots; however, Chipotle, Mediterranean Grill, Noodles & Co., and Wild Berries Bakery and Café, all shared a joint waste management area. Therefore, a more in depth inspection would be needed to determine if any of the aforementioned businesses is the overall contributor or contributors to this hotspot classification. Nine of the businesses surveyed were determined not to be a hotspot.

Only four sites were found to be confirmed hotspots: IHOP Restaurant, Longhorn Steakhouse, Matsutake Sushi and Steak, and Senol Oz Mechanic. However, Senol Oz Mechanic, now known as A & R Auto Care Center, and Longhorn Steakhouse were initially identified as severe hotspots. The Auto Care Center had observed pollution sources within their vehicle operations and their outdoor material storage. The most notable pollution source was an oil spill that, although was covered with an absorbent, had not been cleaned up. The storage of outdoor materials at Longhorn Steakhouse was an observed pollution source for this site. Their cleaning materials and soaps were all stored outside without a storage cover, and their grease bin was open. In addition, there were various stains around and leading to two of the storm drains behind their waste management area. Upon follow-up inspections, these conditions were remediated. Both sites were still considered to be potential hotspots but posed no immediate danger for pollution and did not require additional investigation. Follow-up inspection forms are included in Appendix F.

Table 1 - Businesses Visited in 2015

Name	Company	Address	City	State	Zip Code	NAICs Code	Description
October 22, 2015							
RICHARD ALLEN	CHAMPION BILLIARDS SPORTS CAFÉ	5205 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
MARTHA CASTRO	CHIPOTLE MEXICAN GRILL	5223 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
LUIS NEIRA	IHOP RESTAURANT	5277 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
JEFF SPRING	MCDONALD'S	5203 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
MOHAMMED HYALI	MEDITERRANEAN GRILL	5221 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
<null>	NOODLES & CO	5221 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
<null>	PANDA EXPRESS	5281 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
RAY KRUG	PASTIMES CAFÉ & BANQUET FCLTS	5311 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
SOLEDAD HUNANI	POPEYE'S CHICKEN & BISCUITS	5721 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
DANNY VASQUEZ	ROMANO'S MACARONI GRILL	5201 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
J PATRUCELLA	ROSA'S PIZZA	5500 BUCKEYSTOWN PIKE #408	FREDERICK	MD	21703	72251115	FULL-SERVICE RESTAURANTS
RICKY SCHICKLE	TGI FRIDAY'S	5285 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS

Name	Company	Address	City	State	Zip Code	NAICs Code	Description
GITA NANAVATI	WILD BERRIES BAKERY & CAFÉ	5219 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
October 23, 2015							
CHRIS CHURCHILL	CHURCHILL AUTO CARE	5733 BUCKEYSTOWN PIKE #B	FREDERICK	MD	21704	81111104	GENERAL AUTOMOTIVE REPAIR
CHRIS CLARK	CLARK WELDING CO	5843 URBANA PIKE	FREDERICK	MD	21704	33299910	ALL OTHER MISC FABRICATED METAL PRODUCT MFG
MIKE SCHULTZ	HDFR	5734 URBANA PIKE	FREDERICK	MD	21704	81131027	COML/IND MACH/EQUIP (EXC AUTO/ELCTRNC) RPR/MAINT
ERNIE FINNIFF	LONGHORN STEAKHOUSE	5744 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
MIKE FIELD	LUBE CENTER INC	5715 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	81119101	AUTOMOTIVE OIL CHANGE & LUBRICATION SHOPS
KAI PAK	MATSUTAKE SUSHI & STEAK	5225 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
SOLEDAD HUNANI	POPEYE'S CHICKEN & BISCUITS	5721 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
CINDY EAST	PRECISION TUNE AUTO CARE	5831 BUCKEYSTOWN PIKE #H	FREDERICK	MD	21704	81111104	GENERAL AUTOMOTIVE REPAIR
<null>	SENOL OZ MECHANIC	5608 BUCKEYSTOWN PIKE	FREDERICK	MD	21704	81111104	GENERAL AUTOMOTIVE REPAIR
TIMOTHY CRESSMAN	TOOL IN HAND	5831 BUCKEYSTOWN PIKE #I	FREDERICK	MD	21704	81111104	GENERAL AUTOMOTIVE REPAIR
October 29, 2015							
LYDIA FORNEY	BLUES BBQ CO	5800 URBANA PIKE	FREDERICK	MD	21704	72251117	FULL-SERVICE RESTAURANTS
November 6, 2015							
MICHAEL A DUCKER	AAMCO TRANSMISSIONS	5870 URBANA PIKE	FREDERICK	MD	21704	81111302	AUTOMOTIVE TRANSMISSION REPAIR

5.3.3 Citizen and/or Agency Reporting

Information about how citizens can report illicit discharges is available online on Frederick County Government's Citizen Request Tracker web page at http://www.frederickcountymd.gov/requesttracker.aspx under "Water Pollution Issues". A reporting link is also available at http://www.frederickcountymd.gov/index.aspx?NID=518. In addition, citizens may report a problem through the Monocacy and Catoctin Watershed Alliance website: http://www.watershed-alliance.com/mcwa_problem.html.

The County received one citizen complaint within the reporting timeframe of 1/1/15 and 6/30/15:

4/20/15: Received email from MDE indicating that a property owner in Thurmont (outside Thurmont's jurisdiction) had a long black pipe extending from a basement quite some distance to discharge water into a nearby stream. The County's consultants who perform IDDE investigations are not able to access private property without landowner permission. As such, the complaint was referred back to MDE for further investigation. MDE confirmed that they would follow up with the landowner.

Four additional IDDE investigations, triggered by triennial inspections, were completed by Versar, Inc. during the annual report timeframe of 01/01/15 and 06/30/15 and are discussed in section 5.3.1 Outfall Screening and included in Appendix E.

5.3.4 Spill Response

In the first half of CY2015, Frederick County continued to implement a successful program to respond to illegal dumping and spills. Hazardous spill response calls are forwarded to 911; first responders are trained to respond to hazardous spills. Non-hazardous spill responses, including environmental releases, are forwarded to the Watershed Management Section (WMS). WMS forwards this information to MDE for investigation.

WMS has developed a standard set of procedures for responding to all citizen complaints of spills and illicit discharges, as part of the County's IDDE protocol. The procedures help citizens to report spills to the correct agencies with a minimum of internal transfers. OSER maintains standard procedures for consistent reporting, referral, and addressing of potential illicit discharges, dumping, and spills. These procedures are periodically updated.

For hazardous spills requiring evacuation, the Department of Emergency Preparedness has updated its Emergency Operation Plan, which includes annexes for emergency evacuation; triggers, escalations and evacuation plans; and HazMat response. The County also has a reverse 911 system to perform targeted calling based on georeferenced locations for localized problems like hazardous spills. The Fire Department coordinates the Local Emergency Planning Committee, required under SARA Title III.

The County and others report spills to the National Response Center. Records for Frederick County in the first half of CY2015 are included in the table below (Table 2; USCG, 2015).

Table 2 - Reported Spills in Frederick County from 01/01/2015 - 06/30/2015

Date	Reported By	Address/Location	Material Spilled	Suspected Party	Notes/Comments
02/04/2015	National Response Center	Old Frederick Road and Devilbliss Bridge Road, Frederick MD	Diesel fuel	Hubble Trucking	Caller is reporting a release of diesel from a dump truck to the roadway when the truck was struck broadside and it severed the seam on the saddle tank.

Date	Reported By	Address/Location	Material Spilled	Suspected Party	Notes/Comments
02/14/2015	National Response Center	6625 Spokeshave Court, Frederick MD	Insulation	FM Leasing Services	Caller stated that a company renovated a home and there is insulation that may contain some type of hazardous material in it. The material was placed in an open trash bin in front of the home for disposal and is partially covered.
04/27/2015	National Response Center		Motor oil	Power Transpor-tation	Motor oil discharged from a tractor trailer due to a mechanical failure.
05/01/2015	National Response Center	9917 Woodsboro Road, Woodsboro MD	Oil and diesel fuel	Richard Stein, LLC	Caller stated that the company busts open 55-gallon drums filled with oil and diesel all over the property.
05/01/2015	National Response Center	8909 Bradford Way, Frederick MD	Oil	Unknown	Caller reported the oil pan of a private citizens car hit a man hole cover and caused a release of materials.
05/19/2015	National Response Center	Milepost: BA37.0, Dickerson MD	Diesel fuel	CSX	Diesel fuel discharged from an unknown source due to an unknown cause at this time.
05/20/2015	National Response Center	Route 70 Eastbound at Route27 – mile marker 68, Mount Airy MD	Diesel fuel	Clouse Trucking	Caller stated that a tractor trailer truck rolled over resulting in a discharge of diesel fuel and approximately 5,000 gallons of milk. Caller also stated that a storm sewer was impacted.
05/29/2015	National Response Center	2405 Old National Pike, Middleton MD	Diesel fuel and hydraulic oil	Olden's Tree D Trucking	Caller is reporting a mixture of diesel fuel and hydraulic oil (20 gallons) discharged from a gradeall vehicle due to a vehicle accident.

Date	Reported By	Address/Location	Material Spilled	Suspected Party	Notes/Comments
06/02/2015	National Response Center	Route270 – mile marker 25, Green Valley MD	Diesel fuel	Stevens Transport	Caller stated a trailer came unhitched from the cab and struck the saddle tank of the tractor trailer truck that was pulling the trailer. This resulted in spill of 15 gallons of diesel.
06/10/2015	National Response Center	1202 Rising Ridge Road, Mt Airy MD	Motor oil	Mohawk Floors	Caller is reporting the release of motor oil onto the ground and into a storm drain from a Ryder tractor trailer truck that sprung a leak for unknown reasons.

Source: (USCG, 2015)

5.4 Litter and Floatables

Frederick County recognizes that increases in litter discharges to receiving watershed have become a growing concern within Maryland. The County has evaluated current litter control programs, potential sources, and methods for elimination and opportunities for improvement. The County also proposes to enhance its public outreach program to address Litter and Floatables issues.

5.4.1 Litter Control Programs

The following litter control programs throughout Frederick County are presented below.

- Potomac River Watershed Cleanup (PRWC) - **April 11, 2015**
  - The event is an annual watershed-wide effort to clean up trash along the Potomac River. Partners include the Alice Ferguson Foundation and Frederick County Government. A local cleanup was organized by the Monocacy Scenic River Citizens' Advisory Board at Rivermist Park on Monocacy Blvd.
- Catoctin Creek Park and Nature Center Cleanup - **April 2015**
  - Annual event to clean up trash within the Park's creek bed and banks that is promoted through the Catoctin Creek Park and Nature Center blog.
- Frederick County "Adopt-a-Road" Program - **Ongoing**
  - The Office of Highway Operations coordinates an "Adopt-a-Road" Program to help control litter along County roads. Approximately 84.04 miles of road are maintained by 36 groups across the County. From January through June 2015, a total of 1.245 tons of trash and 12 tires were removed through this program.
- Road Maintenance Activities - **Ongoing**
  - The Office of Highway Operations removed a total of 17.63 tons of trash and 221 tires from January through June 2015. The Office of Highway Operations also conducts street sweeping and inlet cleaning.
- Recycling Outreach (conducted by the Recycling Outreach Program Coordinator under the Frederick County Department of Solid Waste Management) - **Ongoing**

- Community Engagement: meet with community groups and provide speaking/presentations; present displays at public events
- Digital Media: Facebook; e-newsletter; mobile app (MyWaste)
- Print Media: direct mail; newspaper and other advertising media (bus, billboard, etc.); press releases; articles for publications
- Schools: work directly with Frederick County Public Schools (FCPS) to increase awareness among staff and students of waste and recycling issues; include private and home schools in any contests or promotions
- Special Events: conduct contests, drop-off events, award programs and other campaigns to bring attention to and increase support of County programs and goals

- Potomac Watershed Trash Treaty – **signed February 2006**
  - Frederick County pledged to implement trash reduction strategies and to increase education and awareness of the trash issue throughout the Potomac Watershed in efforts to achieve a trash free Potomac by 2013.

5.4.2 Potential Sources

Frederick County collects trash rating data as part of two separate monitoring efforts. The Frederick County Stream Survey (FCSS) program is conducted to assess the status of County streams in terms of water quality, biological condition, and habitat. The FCSS includes probability-based stream monitoring, with sites selected randomly and stratified by watershed. The monitoring is conducted county-wide and consists of 50 sites surveyed each year for a four-year cycle period. In addition to the FCSS monitoring effort, Frederick County conducts targeted restoration monitoring in specific watersheds to support ongoing and potential restoration and community outreach efforts. Both the FCSS and the targeted restoration monitoring efforts include a trash rating based on the amount of human refuse in the stream and along the banks of the sample segment (

Table 3; Appendix G). Fourteen subwatersheds out of twenty - Fishing Creek, Glade Creek, Hunting Creek, Tuscarora Creek, Ballenger Creek, Bennett Creek, Carroll Creek, Lower Bush Creek, Upper Bush Creek, Upper Linganore Creek, Lower Linganore Creek, Little Pipe Creek, Middle Creek, and Little Catoctin Creek South subwatersheds contained the 27 survey sites that received poor and/or marginal trash ratings out of the 330 total sites surveyed under the FCSS monitoring effort and out of the 53 total sites under the targeted restoration monitoring effort (Figure 3). This data indicates that trash problems are not present along the entire lengths of stream networks in Frederick County, but instead may be attributed to trash "hotspots," or dumping sites since the problems are present in isolated locations.

Between 2003 and 2004, the Maryland Department of Natural Resources conducted a Stream Corridor Assessment (SCA) survey of 352.35 miles of stream networks within 10 out of the 20 watersheds in Frederick County to determine and prioritize potential sites for county-managed stream restoration opportunities. One of the environmental problems assessed in the SCA survey methods is the presence of trash dumping sites (Table 4; Appendix G). Glade Creek, Owens Creek, Toms Creek, Tuscarora Creek, Fishing Creek, Ballenger Creek, Upper Linganore Creek, Lower Linganore Creek, and Bennett Creek subwatersheds contained the 21 trash dumping sites that received a moderate and/or severe trash rating out of the 46 total trash dumping sites identified (Figure 4).

Table 3 - Summary of Trash Rating Survey Data

Survey	Optimal	Sub-Optimal	Marginal	Poor	Total
FCSS	243	67	16	4	**330**
Targeted Restoration Monitoring	36	10	7	1	**53**
Total	**279**	**77**	**23**	**5**	**383**
Percent	73%	20%	6%	1%	100%

Table 4 - Summary of Trash Dumping Site Data

Survey	Minor	Low Severity	Moderate	Severe	Very Severe	Total
SCA	13	12	11	10	0	**46**
Percent	28%	26%	24%	22%	0%	100%

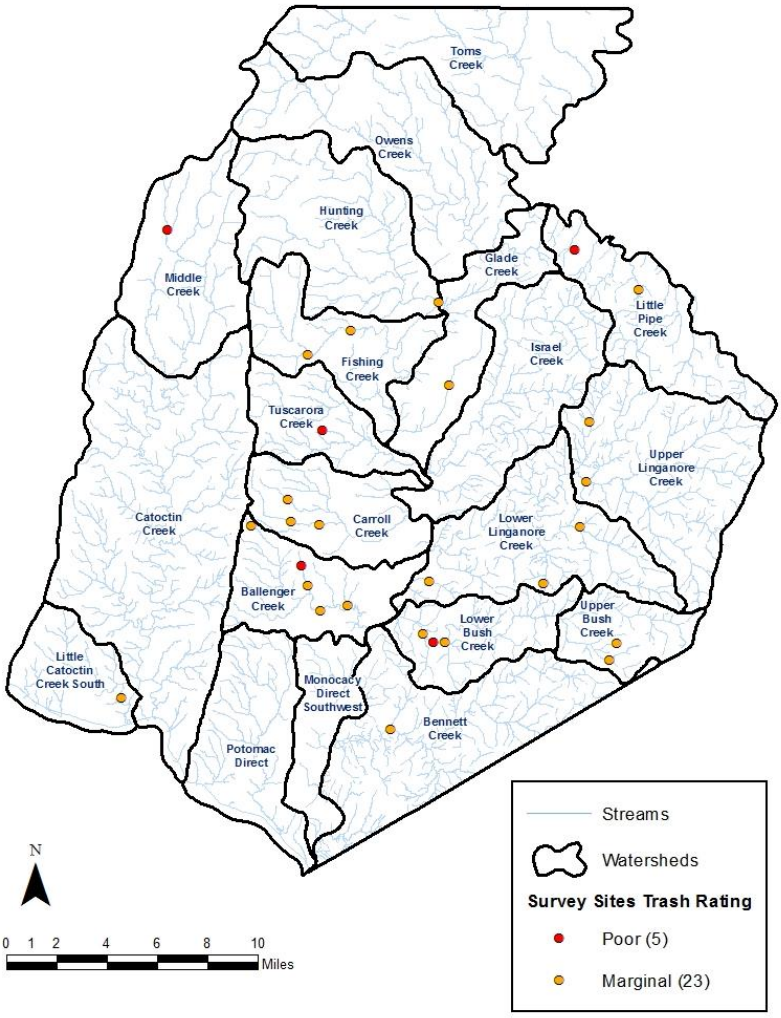

Figure 3 - Trash Problem Areas in Frederick County by Watershed Based on FCSS and Targeted Restoration Monitoring Data

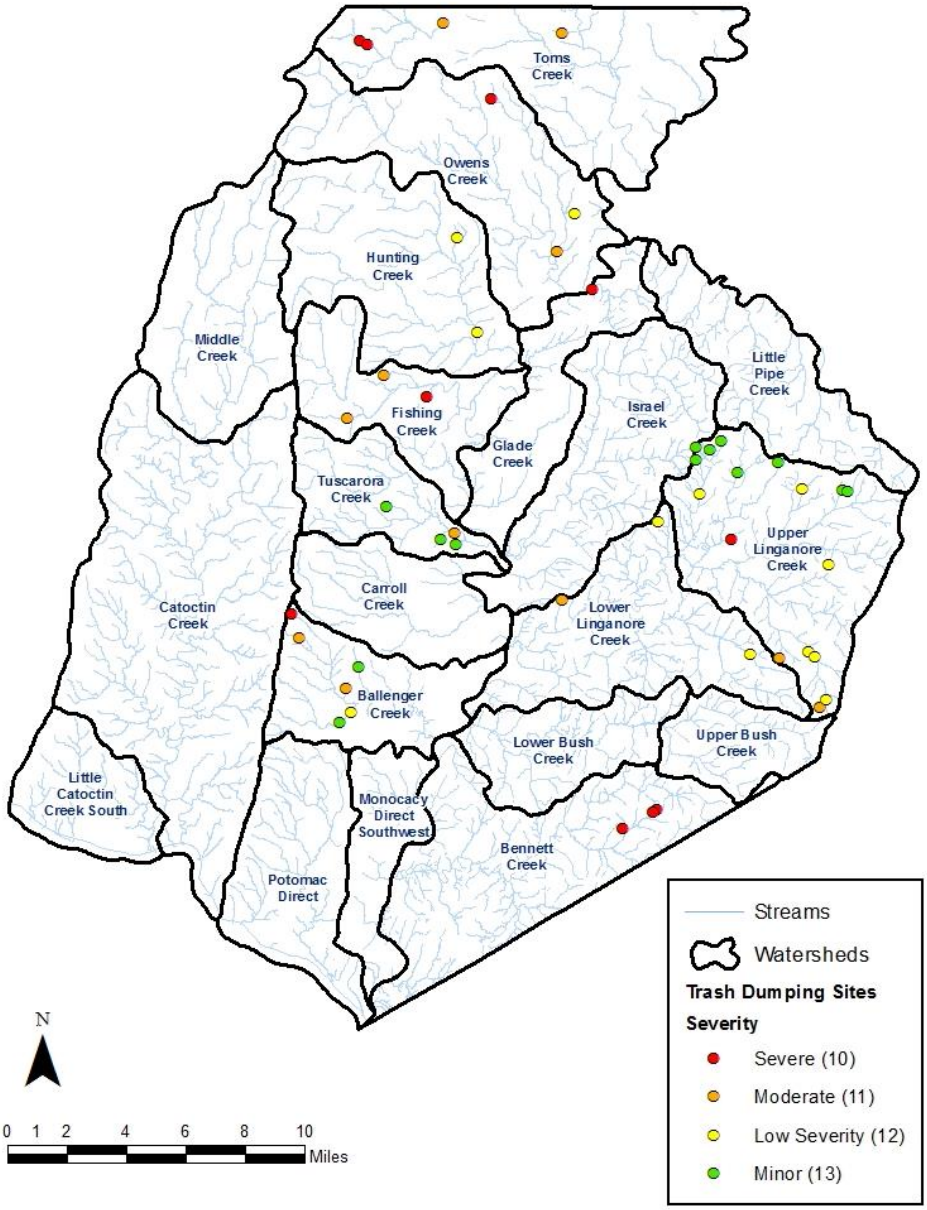

Figure 4 - Trash Dumping Sites by Watershed Based on SCA Data

Trash rating and dumping site data collected from the FCSS, targeted restoration monitoring, and SCA surveys was additionally analyzed based on land use, in order to identify potential sources from various zoning types. All of the sites that received a poor trash rating in the FCSS and targeted restoration monitoring were located within agricultural and resource conservation land use types (Table 5). The dumping sites that received a severe trash rating in the SCA were located within agricultural, resource conservation, low density residential, and village center land use types (Table 6).

Table 5 - Combined FCSS and Targeted Restoration Monitoring Trash Rating Data Based on Land Use Type

Land Use Type		Optimal	Sub-Optimal	Marginal	Poor	Total
A	Agricultural	153	38	7	4	**202**
RC	Resource Conservation	85	20	5	1	**111**
R1	Low Density Residential	18	9	3		**30**
R3	Low Density Residential		1			**1**
PUD	Planned Unit Development	6		2		**8**
VC	Village Center	1				**1**
GI	General Industrial		1			**1**
LI	Limited Industrial	1				**1**
ORI	Office/Research/Industrial	1	1			**2**
MM	Mineral Mining	2				**2**
MXD	Mixed Use Development	1				**1**
Ie	Institutional		1			**1**
MUN	Municipality	5	2	1		**8**
ROW	Right of Way	3	1	3		**7**
	City of Frederick	3	2	2		**7**
	Total	**279**	**76**	**23**	**5**	**383**

Table 6 - SCA Trash Dumping Site Data Based on Land Use Type

Land Use Type		Minor	Low Severity	Moderate	Severe	Very Severe	Total
A	Agricultural	9	10	5	4		**28**
RC	Resource Conservation			3	2		**5**
R1	Low Density Residential	1			3		**4**
R3	Low Density Residential		1				**1**
VC	Village Center				1		**1**
GC	General Commercial	1					**1**
MUN	Municipality		1	2			**3**
	City of Frederick	2		1			**3**
	Total	**13**	**12**	**11**	**10**	**0**	**46**

5.4.3 Methods for Elimination

OSER staff will use the following strategies as methods to eliminate litter and floatables throughout Frederick County's MS4.

- Increased litter prevention education and outreach
- Roadside and stream cleanups – promote and increase participation; promote and support new cleanups
- Adopt-a-Road program – promote and increase participation
- Office of Highway Operations – continue with current road maintenance efforts

- Recycling - continue with current efforts by the Recycling Outreach Program Coordinator

5.4.4 Opportunities for Improvement

Opportunities for improvement include promoting and increasing participation in:

- Adopt-a-Road program
- Potomac River Watershed Cleanup and International Coastal Cleanup events
- Independent clean-ups by affiliated groups (e.g. Catoctin Creek Park and Nature Center)
- Recycling

5.4.5 Public Outreach Program

In order to address litter control problems and develop a litter and floatables public education and outreach program in Frederick County, OSER staff will follow the goals and objectives from The Strategic Plan to Improve Water Quality through Public Outreach in Frederick County, Maryland, published in November 2003.

Frederick County's litter and floatables public education and outreach program will include the dissemination of outreach materials to the public that communicate the level of trash in Frederick County's streams, discourage littering behavior, and encourage individuals or groups to participate in trash cleanups. OSER staff will develop materials specific to Frederick County. The program will also include the use and distribution of available outreach materials developed by outside organizations, such as the Alice Ferguson Foundation or Keep America Beautiful. OSER staff will incorporate additional litter prevention outreach materials into current outreach efforts required under the public education section of the permit (PART IV.D.6). Additional education and outreach will be implemented through print and digital media, advertisements, press releases, newsletter articles, and a resource webpage with the promotion of local trash cleanup events to encourage public participation.

The Alice Ferguson Foundation (AFF) has developed a Regional Litter Prevention Campaign toolkit as part of their Trash Free Potomac Watershed Initiative. The Regional Litter Prevention Campaign toolkit contains resources available for Frederick County to use for the County's public education and outreach program. The toolkit materials include advertisements and visuals, communication pieces, and community outreach pieces. OSER staff will use materials from the AFF toolkit that are appropriate for Frederick County's outreach efforts to reduce littering.

Keep America Beautiful's Cigarette Litter Prevention Program provides resources for anyone to use to establish a program in their local area. Available resources include press releases, brochure, fact sheet, posters, video and audio PSAs, PowerPoint presentation, and webinars. Although OSER is not planning to implement a separate cigarette litter prevention campaign, some of these materials may be useful for OSER's litter outreach efforts.

As part of litter prevention outreach, OSER staff will work with and support organizations that coordinate large and small-scale cleanups in Frederick County. This support by OSER staff will be accomplished through the development and execution of an online webpage to be used as a resource for promoting participation in existing trash cleanup events and coordination of new cleanups, and for educating the public on litter prevention in Frederick County. The webpage will include links to the websites of other organizations who host cleanup events on a yearly basis, such as the Alice Ferguson Foundation or the Ocean Conservancy. The links will direct viewers to websites where viewers can sign up throughout the

year for existing cleanups, find out how to organize a new cleanup event, procure necessary equipment such as safety vests, and learn about trash problems in local and regional watersheds. Included in the resource webpage will also be a list developed by OSER of trash problem areas around Frederick County to target with cleanups.

The Green Leader Challenge, one of 3 sub-challenges that make up the overall Green Homes Challenge, helps County residents adopt environmentally friendly practices. In the Green Leader Challenge, there are 11 actions that educate and motivate Challenge participants to eliminate waste and litter, recycle, and compost. To date, more than 1,800 individuals have registered with the overall Green Homes Challenge and 260 are self-certified as Green Leaders.

The Frederick County Department of Solid Waste Management coordinates a recycling education and outreach program that promotes recycling through community engagement, print and digital media, school presentations, and special events. The County has an overall recycling and waste diversion rate of 54.5% (MDE's Calendar Year 2013 Maryland Waste Diversion Rates & Tonnages Report) – one of the highest diversion rates in the state – and has established a goal of achieving a 60% waste diversion rate by 2025. Four times per year Frederick County's Department of Solid Waste Management sends out useful information on the county's recycling program, including important updates, interesting facts and tips for creating less waste. The Department of Solid Waste Management has information available on its website http://www.frederickcountymd.gov/5634/Waste-Management-Trash-and-Recycling for County residents on various landfill programs, such as disposal of household hazardous wastes, recycling, source reduction, and backyard composting. The continuation of current efforts in this program will be sufficient in meeting the permit requirements for recycling education and outreach and achieving the county recycling goals.

In mid-2015, County Executive Jan Gardner created a solid waste initiative that is designed to look at waste management options including waste reduction and recycling. According to the Scope of Work, the first phase is to decide by consensus "which waste management and recycling alternatives should be specifically studied and evaluated in more detail." This phase includes a series of five outreach meetings around the county. Ideas will be created by the public through brainstorming sessions with an independent facilitator. The facilitator will share what best practices are being used throughout the country for waste disposal and recycling and discuss issues like sustainability and cost. Public input will be sought on viable waste disposal and recycling alternatives like anaerobic digestion of waste, organics/food scrap composting, mixed waste processing, construction/demolition recycling, and more.

The first phase will also review with the public some up-front assumptions like revenue requirements, recycling rate calculations, and legislative requirements. The facilitator will provide a summary of each outreach meeting to county staff and a steering committee. The County Executive appointed this steering committee from members of the public. The steering committee's job is to assist the county executive and county staff at decision points or milestones. The steering committee and the consultant will help to create the short list of options for further evaluation in the second phase. This short list will also be vetted with the public and will be part of a draft report.

In the second phase of the process, the consultant will conduct a four-season waste stream analysis, which will analyze the alternatives recommended the steering committee and the public process for viability. In addition to costs, regulations, permitting issues, risks and rewards and other considerations, the review will include citizen willingness and impacts to municipalities and businesses. Phase 2 will conclude with recommendations about how to bid project alternatives.

The results from Phase I and 2 will be published in a final report by the consultant to the County Executive and County Council. These publicly elected officials will have to consider if they want to have the contractor develop contract documents for a procurement process in Phase 3.

Table 7 - Sample Calendar Year 2016 Outreach Program Plan for Litter and Floatables

Month	Outreach Activity
January	NA
February	• Promote PRWC and Catoctin Creek Park and Nature Center Cleanups: Article/announcement in OSER Winter Newsletter
March	• Promote PRWC event: PSAs, press release, flyers, social media, webpage • Promote Catoctin Creek Park and Nature Center Cleanup
April	• Promote PRWC and Catoctin Creek Park and Nature Center Cleanups: Article/announcement in OSER Spring Newsletter • Event: PRWC - Assist groups in organizing individual cleanups • Event: Catoctin Creek Park and Nature Center Cleanup • Catoctin Creek Park and Nature Center NatureFest event: OSER booth with Litter Quiz and Flyer to disseminate to public
May	NA
June	NA
July	• Promote ICC event: Article/announcement in OSER Summer Newsletter
August	• Promote ICC event: PSAs, press release, flyers, social media, webpage
September	• Event: ICC - Assist groups in organizing individual cleanups • "In The Street" event: OSER booth with Litter Quiz and Flyer to disseminate to public
October	• Event: ICC event - Assist groups in organizing individual cleanups • Fall OSER Newsletter: Article to promote Adopt-a-Road program
November	NA
December	Report on progress

**Specific events subject to change*

The following metrics may be used to measure the effectiveness of the education and outreach program:

- Number of clean up events either planned or supported
- Number of volunteers at cleanup events
- Pounds or bags of garbage collected at cleanup events or in the Adopt-a-Road Program
- Frederick County Stream Survey (FCSS) monitoring data
- County-wide recycling and waste diversion rate
- Number of events where outreach information is disseminated

OSER will submit an annual report which details progress toward implementing the public education and outreach program including the status of public outreach efforts including resources (e.g., personnel and financial) expended and the effectiveness of all program components.

5.5 Property Management and Maintenance

The following eleven (11) Frederick county-owned and operated facilities are currently covered by the *12-SW General Permit for Discharges from Stormwater Associated with Industrial Activities:*

Table 8 - NOIs with Permit Coverage through December 31, 2018

Facility Name	Permit Number	NOI Submitted	SWPPP Developed	Status of SWPPP	Annual Review by MDE
Jefferson Copperfield Wastewater Treatment Plant	12SW2283	Yes	Yes	Yes	Yes
Ballenger McKinney Wastewater Treatment Plant	12SW1878	Yes	Yes	Yes	Yes
Reich's Ford Landfill	12SW2366	Yes	Yes	Yes	Yes
331 Montevue Lane (Frederick) Highway Operations Yard	12SW1890	Yes	Yes	Yes	Yes
Thurmont Highway Operations Yard	12SW1892	Yes	Yes	Yes	Yes
Johnsville Highway Operations Yard	12SW1891	Yes	Yes	Yes	Yes
Myersville Highway Operations Yard	12SW2285	Yes	Yes	Yes	Yes
Jefferson Highway Operations Yard	12SW2291	Yes	Yes	Yes	Yes
Urbana Highway Operations Yard	12SW1893	Yes	Yes	Yes	Yes
Law Enforcement Center	12SW1942	Yes	Yes	Yes	Yes
Transit	12SW1888	Yes	Yes	Yes	Yes

The County originally submitted twelve (12) NOI's, all which were accepted by MDE resulting in permit coverage through December 31, 2018. However, New Market Wastewater Treatment Plant (12SW2282) was subsequently decommissioned and permit coverage was terminated on April 10, 2105.

All facilities currently covered by the 12-SW permit have Stormwater Pollution Prevention Plans (SWPPPs) that were last updated in April 2015. These facilities have identified SWPPP team members who perform quarterly inspections and visual monitoring. Annual training has been scheduled for November 2015. Spills are reported and documented internally and MDE is notified as appropriate. Maryland Environmental Service has been contracted to assist, as necessary, with spill response and other 12-SW related tasks.

Data in relation to industrial facilities managed for stormwater can be found in the MunicipalFacilities feature class in the MDE_NPDES_MS4 geodatabase.

5.5.1 Road Maintenance Activities

During 2015, Frederick County continued to implement recommendations from its 2002 Assessment of Road Maintenance Activities (Versar 2002). The objective of this study was to assess the effects of road maintenance activities on stormwater runoff and resulting impacts on surface water quality. The assessment evaluated current practices, analyzed alternative practices, and presented a plan to incorporate alternative practices into the County's road maintenance programs. Members of the County's Office of Highway Operations provided data and information on current practices and plans of the Department. Activities included in the evaluation were chemical usage in snow and ice removal, herbicide spraying for vegetation control, street sweeping, litter control, road surface maintenance, and

maintenance of unpaved surfaces. The assessment report was submitted to MDE on June 11, 2002 and was found to meet NPDES permit requirements for developing a plan to reduce pollutants associated with road maintenance activities.

The County continues to move ahead with several of the recommendations developed in the June 2002 evaluation report. An example of quarterly reports for the first two quarters of 2015, prepared by the Office of Highway Operations for a variety of subject areas, is provided in Appendix H. The activities that the County Office of Highway Operations undertook in during the reporting timeframe of 1/1/15 through 6/30/15 to reduce runoff pollution were:

1. Street Sweeping: Street sweeping was conducted April through June of 2015. The sweeper truck was not in use during January through March. A total of 217.03 acres (298 miles) of road were swept in 2015. A total of 145 cubic yards of material was removed from roads in Frederick County during the first half of CY2015.

2. Deicing: Caliber M1000, which is a 30% Magnesium Chloride solution with an agricultural by-product, is used in 48 of the County's trucks when the temperature is ≤ 25 ºF. The trucks are equipped with 90-gallon tanks that apply the solution onto the salt mixture as it is spread onto the road. Overall, the County has 51 full-sized, ten-ton dump trucks and 14 smaller, one-ton dump trucks for deicing. The Caliber M1000 makes the salt mix more effective and prevents corrosion. The County does not use M1000 for de-icing at temperatures above 25 ºF. The M1000 is also sprayed onto the salt to pre-treat the roads, if the timing and conditions warrant.

   According to product literature for Caliber M1000 (http://www.innovativecompany.com /products/winter /liquid-enhanced-liquid/caliber-m1000):

   "As a pre-wetting agent for salt and sand, Caliber M1000 reduces bounce and scatter, increases the speed at which the salt begins working, increases the melting capacity of the salt, and permits the use of salt at lower temperatures. Additionally, Caliber M1000 also reduces corrosion, inhibits crystal formation and product fallout at lower temperatures, and improves roadway traction when compared to other liquid products."

   Additional information on Caliber M1000 is also available at: http://www .innovativecompany.com/userfiles/file/sell_sheets/Caliber_M1000_Brochure.pdf.

   The use of deicers in the first half of CY 2015, by DNR watershed, is presented in **Error! Reference source not found.**. A total of 9,735 gallons of liquid deicer (Caliber M1000), 24,579 tons of salt (consisting of over 98.5% sodium chloride by weight), and 1,075 tons anti-skid were used for all watersheds. Prior to 2009, Highway Operations used cinders instead of anti-skid. The switch to anti-skid was the result of the suspension of distribution of bottom ash for winter road treatment in order to conform to the Maryland Coal Combustion Byproducts (CCB) regulations. These regulations prohibit placement of CCBs in areas other than approved disposal facilities. As a result, Highway Operations began using an anti-skid material purchased from local quarries. It is a small, uniform size stone that contains very little dust/fine material. Thus far, the material has been working well. Starting in December 2008, one of the objectives of Highway Operations was to use more liquid deicer in an attempt to use less salt. They are also pre-treating the roads, whenever appropriate, to apply material under the snow/ sleet / ice layer so that frozen precipitation cannot bond to the road, which should result in a significant reduction in materials used. In addition,

Highway Operations developed and implemented a Salt Management Plan to provide a framework to deliver safe, efficient roadway systems during winter storm events in a cost effective and environmentally sensitive manner.

3. Inlet Cleaning: All Highway Operations foremen began reporting inlet-cleaning statistics in 2004. A total of 438 inlets were cleaned in 2015. In addition, 14 inlets were vactored. Inlet-cleaning statistics are reported in the quarterly reports under Drainage (Appendix H).

4. Data Collection: Reports were collected quarterly from district foremen and submitted to the department head. At the end of 2009, data collection improvements were made to better track application of snow removal materials as discussed above under "Deicing".

5. Reducing the Use of Pesticides, Herbicides, Fertilizers and Other Pollutants: The 2002 road maintenance assessment report presented data on two herbicides, Razor and Pendulum, which were used by the County's Office of Highway Operations in 2001. Pendulum, with 37.4% pendamethalin as the active ingredient, was noted to be an environmentally unfriendly chemical with potential impacts to aquatic life. The report recommended that the County review its use and consider alternative treatments. As reported in the 2003 Pesticide/ Herbicide report (Versar 2003) and subsequent NPDES Annual Reports (see Section 5.5.2), the use of Pendulum has been discontinued. In 2015, Ranger Pro (a generic version of Roundup), DMA 4 IVM, and CWC-90 (a non-ionic surfactant) were used for weed control by the Office of Highway Operations. In 2015, the Office of Highway Operations sprayed 44.8 gallons (diluted quantity) of herbicide along approximately 23.2 miles of road guardrails in the County. See Section 5.5.2 for a breakdown of quantities.

Evaluation: The County's Office of Highways and Transportation continues to implement the recommendations of the Road Maintenance Report and to experiment with new technology to reduce its activities' impacts on water quality.

Table 9 - Frederick County Office of Highway Operations Use of Deicers, by Watershed, 01/01/2015 through 06/30/2015. Liquid Used is Caliber M1000.

Snow Removal Materials Used from 01/01/2015 through 06/30/2015																		
	Catoctin Creek			Double Pipe Creek			Lower Monocacy			Potomac			Upper Monocacy			Totals		
	Gallons	Tons		Gallons	Tons		Gallons	Tons		Gallons	Tons		Gallons	Tons		Gallons	Tons	
Month	Liquid	Salt	Anti-Skid	Liquid	Salt	Anti-Skid	Liquid	Salt	Anti-Skid	Liquid	Salt	Anti-Skid	Liquid	Salt	Anti-Skid	Liquid	Salt	Anti-Skid
January	2,685	2,943	276	135	526	0	1,240	4,971	67	885	757	0	1,455	4,286	48	6,400	13,482	391
February	520	1,681	70	0	256	0	620	2,690	55	100	300	0	1,060	2,066	48	2,300	6,993	173
March	225	960	236	0	174	30	290	1,504	113	320	230	18	200	1,236	114	1,035	4,104	511
Totals	3,430	5,584	582	135	956	30	2,150	9,165	235	1,305	1,287	18	2,715	7,588	210	9,735	24,579	1,075

5.5.2 Herbicides, Pesticides, Fertilizers

Because of concern for environmental health, MDE, through the requirements of NPDES MS4 Permits, requires local jurisdictions to evaluate their current uses of pesticides, herbicides, and fertilizers and to seek opportunities to reduce use of these materials. To address this requirement, during 2002-2003, Frederick County sponsored a study to characterize uses of pesticides, herbicides, and fertilizers by County agencies and to identify potential reduction strategies - *Recommendations for Alternatives to Pesticide/Herbicide/Fertilizer Use for Frederick County, December 17, 2003* (Versar 2003)

Frederick County initiated this study in fall 2002 by surveying County divisions about pesticide, herbicide, and fertilizer use at all County-owned facilities and by all Frederick County Government agencies or departments. At the time, four County units were found to apply herbicides, pesticides, and/or fertilizers: (1) the Maryland Department of Agriculture's (MDA) Vector Control Program, which works in conjunction with the Frederick County Mosquito Control Program, (2) the Division of Parks and Recreation, (3) Frederick County's Office of Highway Operations, and (4) the Frederick County Weed Control Program.

Study results indicated that pesticide/herbicide/fertilizer use by Frederick County did not require any drastic reduction in application practices because County agencies had, in general, already minimized use of these chemicals, or were already using more environmentally acceptable substitutes. In most cases, the overall recommendation was to continue current chemical control practices, while considering possible biological and mechanical controls that could be used in place of, or in combination with, current practices.

A number of practices are already employed by County personnel to control the application of chemicals and, where possible, to use minimal amounts. In general, most Frederick County departments reported applying pesticides on an "as needed" basis, while fertilizer is applied one to three times per year at specific locations. Most of the departments surveyed indicated specifically that application rates were based on label instructions and were made at the lowest rate required for effectiveness.

The County's 2014 Annual Report provided an overview of the amounts and types of chemicals used from 2004 through 2014 since the completion of the 2002 study. With the issuance of the County's new permit, accounting of the amounts and types of chemicals used will start over at 2015. Herbicide, pesticide, and fertilizer use by County Department from 01/01/15 through 06/30/15 is presented in Appendix I.

Herbicide Use

Frederick County Weed Control Program, Frederick County's Division of Parks and Recreation, and Frederick County's Office of Highway Operations continue to monitor weather conditions around the time of application; applications are not performed if heavy rain is expected within 2 hours of application. The Weed Control Program continues to verify that application personnel are registered with the MDA Pesticide

Regulation Section and are either licensed applicators or work directly under the supervision of one.

As noted in the Road Maintenance Activities section (Section 5.5.1), Frederick County Highway Operations has discontinued the use of the herbicide Pendulum, which is toxic to aquatic life, and has replaced its use of Razor with more environmentally friendly herbicides, which included Ranger Pro (a generic version of Roundup), DMA 4 IVM, and CWC-90 (a non-ionic surfactant) in 2015.

Herbicide use by County Department from 01/01/15 through 06/30/15 is presented in Appendix I.

5.6 Public Outreach and Education Program

In the first half of 2015, OSER staff continued to make impacts through the County's public outreach and education program. Frederick County addressed permit-suggested outreach topics and met its own goals and objectives from *The Strategic Plan to Improve Water Quality through Public Outreach in Frederick County, Maryland*, published in November 2003. Outreach activities were used to educate citizens, to direct the course of watershed plans, and to identify landowners for potential restoration activities.

Key outreach efforts discussed in greater detail in the section below include:

- Outreach related to the Monocacy & Catoctin Watershed Alliance (MCWA);
- Outreach related to the Green Homes Challenge (GHC), and;
- Other County Outreach Initiatives.

The results of the County's outreach efforts can be seen in the following sections and in the summary of public outreach and education activities in Table 10, as well as the public outreach initiatives documented in Appendix J.

Table 10 - Summary of public outreach and education activities

Type	Date(s)	Description
Water Conservation		
Alliance Web Page	Ongoing	The Alliance web pages (www.watershed-alliance.com) feature information for citizens on water conservation at home, at school, and on the farm.
Rain Barrel Promotion	Ongoing	The Scott Key Center, a division of the Frederick County Health Department, offered water-saving Rainwater Collection Systems. Developmentally disabled clients at the Scott Key Center convert recycled olive barrels into rain barrels and make them available for purchase to Frederick County residents. Rain Barrels are available for some county residents through the grant- funded Expanded Neighborhood Green Program
Stormwater Management Facility Implementation and Maintenance		
CSN Stormwater BMP Maintenance Workshop	6/17/15	Frederick County and the Chesapeake Stormwater Network co-hosted a Stormwater BMP Inspection and Maintenance training in Frederick County, MD. At this workshop an overview of the various MS4 permit and Chesapeake Bay requirements were given and the group reviewed aspects of various CSN resources that could be utilized to inspect and maintain stormwater facilities. A field component was held at the site to give participants first-hand experience in inspecting installed BMPs.
Point of Rocks Neighborhood Comprehensive Stormwater Management Plan	Various	OSER Staff conducted the third public informational meeting with the Point of Rocks neighborhood on the draft Report for the Comprehensive Stormwater Management Plan. A final Report is in progress and funding for the recommended restoration projects was requested as part of the FY16 CIP submission. The final Report will be published to OSER's website once approved by County staff. The website (http://www.frederickcountymd.gov/index.aspx?NID=5240) was maintained to facilitate communication between the community and OSER staff.

Type	Date(s)	Description
Woody Vegetation Control Methods Handout	Ongoing	County SWM inspection staff routinely hand out a one-page fact sheet, "Woody Vegetation Control Methods: Guidelines for Stormwater Facilities", to homeowner associations, property management groups, developers, and others responsible for maintaining stormwater management facilities.
Inspection Program	Ongoing	Stormwater Management Facility inspections are conducted triennially with explicit direction for maintenance/correction when problems are discovered.
Erosion and Sediment Control		
Backyard Buffers Program	March-April	Maryland Forest Service, an Alliance partner, worked with the County to conduct outreach that provides free trees to homeowners with frontage on unbuffered streams. The program distributed 95 tree bundles (containing 25 seedlings each) to Frederick County households.
Lawn Care and Landscape Management		
Catoctin Creek Park and Nature Center Planting Event	4/18, 4/22 and 4/25	OSER staff organized volunteers to plant approximately 300 trees on 1 acre of riparian buffer at the Catoctin Creek Park and Nature Center. Volunteers included over 100 people from Goodwill Industries, The Boy Scouts of America, The Common Market, and Middletown High School. In addition to planting trees, volunteers learned about the scientific basis for planting riparian buffers.
Green Neighbor Forum	2/28	This exciting half-day program introduces homeowners and business owners to practical steps they can take now to improve their local environment, reduce storm water run-off, make their back yards more hospitable to local fauna, and more. OSER sponsored and had a presenter and booth at this event. Staff from OSER spoke to neighbors about bay-friendly practices for their lawn via the Neighborhood Green Program, and encouraged enrollment in the County's Green Homes Challenge.
17th Annual Native Plant Sale	4/25	The 18th Annual Native Plant Sale was held at the Audrey Carroll Audubon Sanctuary with a large selection of native woody and herbaceous plants as well as information on how to plant and care for them and the benefits of using native plants. The Audubon Society of Central Maryland, an Alliance partner, sponsors the native plant sale.
Neighborhood Green	5/19	These workshops provided information on the expanded Neighborhood Green Program and ways to control stormwater runoff on residential properties by installing best management practices like rain gardens, rain barrels, conservation landscaping and tree planting.
Maryland Urban and Community Forest Committee (MUCFC) Meetings	Quarterly	The WMS Project Manager is a member of the Maryland Urban and Community Forest Committee (MUCFC) and participates in quarterly meetings. The MUCFC is a volunteer group of citizens, professionals, and government officials united to protect and enhance Maryland's forest ecosystems. MUCFC is a sub-committee of the Maryland Association of Forest Conservancy District Boards. The primary functions of the Committee are to promote and coordinate the Maryland Community PLANT Award Program that officially recognizes communities planting and caring for trees, and to administer grants to schools and communities through their local Forestry Boards that promote planting and care of trees.

Type	Date(s)	Description
Spring Ridge Green Homes Challenge presentation	3/18	12 Spring Ridge residents were informed about the Green Homes Challenge and the lawncare and landscape management best practices promoted through the Green Leader Challenge and Tip Sheets.
Catoctin Nature Fest	4/25	OSER hosted a table at this event to promote the Green Homes Challenge and Neighborhood Green programs. 34 adults were educated about these program opportunities and were offered lawn care and landscape management best practices information through Green Leader Tip Sheets.
Frederick County Home Show	3/21 – 3/22	OSER hosted a booth at this 2-day event with the objective of informing County residents about the Neighborhood Green and Green Homes Challenge programs. Table hosts informed 240 visitors about these programs and provided lawncare and landscape management best practices information through our Green Leader Tip Sheets.
Alliance Web Page	Ongoing	The Alliance website (www.watershed-alliance.com) contains information relating to lawn care and landscape management.
Green Leader Challenge interactive web page	Ongoing	The Green Leader Challenge, one of 3 sub-challenges that make up the overall Green Homes Challenge, helps County residents adopt environmentally friendly practices. In the Green Leader Challenge, there are 11 outdoor water conservation actions and 17 other outdoors and yard actions that educate and motivate Challenge participants to adopt lawn care and landscape management best practices. To date, more than 1,700 individuals have registered with the overall Green Homes Challenge and 260 are self-certified as Green Leaders.
Household Hazardous Waste		
Household Hazardous Waste Day	5/9 & 10/17	The County sponsors two household hazardous waste (HHW) days each year and promotes them widely in the media. Pharmaceuticals (in their original containers) are now acceptable items for drop-off at HHW events.
Prescription Drug Disposal	Ongoing	There are several sites throughout the county where citizens can safely dispose of their expired and/or unwanted household medicines and prescription drugs. This is a collaborative effort between the community and the Frederick County Health Department and local law enforcement agencies.
County Web Page	Ongoing	The Department of Solid Waste Management has information available on its website (https://frederickcountymd.gov/529/Landfill-Information) for County residents on various landfill programs, such as disposal of household hazardous wastes, recycling, source reduction, and backyard composting.
Used Motor Oil and Antifreeze Drop-off Sites	Ongoing	The county maintains a list of used motor oil recycling drop-off locations on its website (http://www.frederickcountymd.gov/index.aspx?nid=1753).
Green Leader Challenge interactive web page	Ongoing	The Green Leader Challenge, one of 3 sub-challenges that make up the overall Green Homes Challenge, helps County residents adopt environmentally friendly practices. In the Green Leader Challenge, there are 5 actions that educate and motivate Challenge participants to adopt practices that minimize or eliminate household hazardous waste. To date, more than 1,700 individuals have registered with the overall Green Homes Challenge and 260 are self-certified as Green Leaders.

5.6.1 Outreach Related to Monocacy & Catoctin Watershed Alliance (MCWA)

As described in previous Annual Reports, the Upper and Lower Monocacy Watershed Restoration Action Strategy (WRAS) Steering Committees developed the Monocacy & Catoctin Watershed Alliance (MCWA or the Alliance) in order to continue outreach begun during the Upper and Lower Monocacy WRAS efforts and to begin implementation of the Upper and Lower Monocacy WRAS plans.

County staff continued to coordinate with MCWA in 2015. Three to four meetings each year enables attendees to discuss educational outreach opportunities as well as develop restoration and protection projects to support water quality and habitat initiatives. Partners involved in MCWA include but are not limited to:

- Local Organizations
  - Audubon Society of Central Maryland
  - Catoctin and Frederick Soil Conservation Districts
  - Catoctin Forest Alliance
  - Frederick County Forest Conservancy District Board
  - Catoctin Land Trust
  - Frederick County Conservation Club
  - Frederick County Master Gardeners
  - Friends of Rural Roads of Frederick County
  - Local Citizens
  - Bar-T Mountainside Challenge & Retreat Center
- Regional Organizations
  - Potomac Conservancy
  - Potomac Watershed Partnership
  - Interstate Commission on the Potomac River Basin (ICPRB)
  - Center for Watershed Protection
  - Potomac Valley Fly Fishers, Inc.
  - Chesapeake Conservation Corps
  - Trout Unlimited
  - Pinchot Institute for Conservation
  - MD Chapter of the American Chestnut Foundation
- Funding Agencies
  - Chesapeake Bay Trust
  - Alice Ferguson Foundation
  - Maryland Dept. of the Environment/U.S. EPA Clean Water Act Section 319 (h) Program
  - Maryland Urban & Community Forestry Committee (MUCFC)
  - National Fish and Wildlife Foundation (NFWF)
  - Chesapeake & Atlantic Coastal Bays Trust Fund
- Educational Institutions
  - Hood College
  - Mount Saint Mary's University
  - University of Maryland Extension Office
  - Frederick County Public Schools (FCPS)
- Government Organizations
  - The Former Frederick County Board of County Commissioners
  - The New Frederick County Council

- The New Frederick County Executive
- Community Development Division
- Office of Sustainability and Environmental Resources, Watershed Management Section
- Comprehensive Planning
- Development Review
- Permits and Inspections
- Division of Public Works
- Division of Utilities and Solid Waste Management
- Health Department, Environmental Health Section
- Division of Parks and Recreation
- Sustainability Commission
- Municipalities in Frederick County
- Maryland Department of Natural Resources
    - Forest Service
    - Fisheries
    - Watersheds Program
    - Wildlife & Heritage Service
- Maryland Department of the Environment
- Cunningham Falls State Park
- National Park Service
    - Catoctin Mountain Park
    - Monocacy National Battlefield Park
    - Rivers, Trails and Conservation Assistance
- U.S. Environmental Protection Agency
    - Environmental Information and Analysis
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
    - Leetown Science Center – Aquatic Ecology Branch
- Adams County (PA) SCD
- Carroll County Bureau of Resource Management

Public outreach efforts implemented by the Alliance during 2015 included Alliance website updates, the quarterly E-newsletters, the Watershed Steward Program, and participation in the Catoctin Furnace Fall Festival. The Community Restoration Coordinator also took part in instructional/outreach opportunities at Hood College and Camp Airy in Thurmont.

The Alliance website (www.watershed-alliance.com) features articles covering six general topic areas: Protect, Restore, Enjoy, Connect, Educate, and Study. New articles in each section are posted quarterly. The website also features other pages that provide answers to frequently asked questions, a calendar of events, links to various websites, information on how to report a problem, information on the watersheds of Frederick County, and publications. The articles available on the Alliance website are also featured in the OSER quarterly e-newsletter, expanding the Alliance's reach to more than 2,200 County households and/or Alliance partners.

The MCWA Watershed Steward Program was developed to recognize the efforts of community members to protect and restore the natural resources of the Monocacy & Catoctin watersheds in Frederick County by implementing conservation and best management practices on their property. Watershed Steward

signs or certificates are available to community members who meet the criteria for one of eight different categories:

1) Improving Watershed Health Through Community Partnerships
2) Rain Garden
3) Forest Conservation Practice
4) Agricultural Conservation Practice
5) Forest Land Protection
6) Farm Land Protection
7) Tree Planting
8) Wildlife Habitat Improvement

Alliance members developed a set of criteria and a nomination form to be completed by the sponsor. The original printing of the signs was funded through a grant from the Chesapeake Bay Trust with a match provided by the Frederick County WMS. In past years, over 180 signs have been distributed and installed around the County.

5.6.2 Outreach Related to the Green Homes Challenge (GHC)

In addition to MCWA, OSER coordinates the Green Homes Challenge (GHC) program. The GHC combines proven outreach strategies and concrete actions in a unified, comprehensive approach that helps Frederick County residents adopt environmentally friendly practices, reduce energy use and utility bills, and use renewable energy.

The framework for the Challenge is a three-level Green Homes Challenge Certification Program; however, the educational, incentive, loan, and cooperative purchasing components are available to all whether or not residents choose to complete certification. The program incorporates incentives and behavior change strategies and is designed to meet the needs of people who like to do things themselves, prefer one-on-one mentoring, or are motivated by group participation.

The three Challenges and corresponding certification levels are:

1. Be a Power Saver -- Save Our Energy, Bank Your Money!

   Focuses on engaging and educating Frederick County households about the benefits of saving energy; emphasizes home energy audits, energy saving action plans, and retrofit projects.

2. Be a Green Leader -- Green Your Lifestyle, Protect Our Resources!

   Focuses on changes households can make related to their transportation, food choices, homes, yards, and offices that are environmentally friendly and reduce greenhouse gases. There are specific sections of this Challenge devoted to waste management, indoor and outdoor water conservation, and outdoor and yard maintenance practices to protect and improve water quality. This Challenge officially launched summer 2012.

3. Be a Renewable Star -- Renew Your Energy, Clear Our Air!
   Focuses on promoting renewable energy options through purchasing green power and renewable energy credits, and installing renewable energy systems with assistance from grants and cooperative purchasing (Launched 2013).

The outreach associated with the Green Leader Challenge focuses on improving water quality and addresses permit-suggested outreach topics. As of June 30, 2015, more than 1,700 households had registered with the Green Homes Challenge and 241 households had completed Green Leader Certification. The Green Homes Challenge Recognition Event was held on February 25, 2015.

Evaluation: Frederick County continues to excel in public outreach. Not only has Frederick County addressed all of the suggested topics for outreach in the NPDES permit, it has also extended its public outreach strategy to meet restoration goals. Frederick County has greatly expanded its network through partnerships with local and regional organizations, particularly through the Monocacy & Catoctin Watershed Alliance. Agencies within Frederick County continue to educate the public about water quality through diverse programs.

6 Watershed Assessment and Restoration

6.1 Watershed Assessment

There are five 8-digit watersheds within Frederick County:

- Upper Monocacy River
- Lower Monocacy River
- Double Pipe Creek
- Catoctin Creek
- Potomac River – Frederick County

Frederick County is currently conducting watershed assessments for the Lower and Upper Monocacy River Watersheds.

6.1.1 Lower Monocacy River Water Assessment

The Lower Monocacy River watershed is 169,117 acres in size and is located within Frederick County, Carroll County, and Montgomery County. A watershed assessment is currently underway to provide a roadmap for meeting NPDES Phase I and Chesapeake Bay TMDL requirements. The watershed assessment will analyze existing conditions, identify priority areas for restoration, prioritize restoration projects to address target pollutants, develop cost estimates for implementation, propose a schedule for implementation, discuss education and outreach opportunities, and establish a process for monitoring and measuring project success. There are four assessment components:

1. Evaluate Existing Stormwater Management Best Management Practices.
2. Re-evaluate proposed projects from previously completed watershed assessments
3. Conduct a visual survey of untreated impervious areas
4. Conduct spot stream assessments at a sampling of road crossings.

Frederick County is currently reviewing its first draft of the Lower Monocacy Watershed Assessment.

6.1.2 Upper Monocacy Watershed Assessment

The Upper Monocacy watershed covers approximately 204 square miles and has about 424 miles of streams. A watershed assessment is currently underway to provide a roadmap for meeting NPDES Phase I and Chesapeake Bay TMDL requirements. The watershed assessment will analyze existing conditions, identify priority areas for restoration, prioritize restoration projects to address target pollutants, develop cost estimates for implementation, propose a schedule for implementation, discuss education and outreach opportunities, and establish a process for monitoring and measuring project success.

Data collection, field work and a preliminary analysis has been completed. A proposed restoration plan for this watershed is currently in development. Frederick County expects a first draft for the Upper Monocacy Watershed Assessment in February 2016.

6.2 Restoration Plans

As a requirement of section PART IV.E.2.b of the NPDES MS4 Discharge Permit issued by MDE to Frederick County, the County must develop restoration plans for each stormwater wasteload allocation (SW-WLA) approved by the Environmental Protection Agency (EPA) prior to the effective date of the permit. This applies to all current local TMDLs as well as any new TMDLs approved by EPA. There are currently 12 final approved TMDLs within Frederick County with either an individual or aggregate SW-WLA, shown in Table 11 below.

Table 11 - Frederick County Local TMDLs with SW-WLAs

Segment	Impairment	Allocation Type	Baseline Year
Catoctin Creek	Phosphorus	Individual	2009
Catoctin Creek	Sediment	Aggregate	2000
Double Pipe Creek	Phosphorus	Individual	2009
Double Pipe Creek	Sediment	Aggregate	2000
Double Pipe Creek	Escherichia coli	Aggregate	2004
Lower Monocacy River	Phosphorus	Individual	2009
Lower Monocacy River	Sediment	Aggregate	2000
Lower Monocacy River	Escherichia coli	Aggregate	2004
Potomac River Montgomery County	Sediment	Individual	2005
Upper Monocacy River	Phosphorus	Individual	2009
Upper Monocacy River	Sediment	Aggregate	2000
Upper Monocacy River	Escherichia coli	Aggregate	2004

Frederick County's MS4 permit is currently in Frederick Circuit Court, case number 10-C-15-000293. A Joint Motion for Extend Stay of Proceedings, included as Appendix N, was granted on September 18, 2015 that included "3. That the County's deadline for submittal of restoration plans pursuant to Part IV.E.2.b of its MS4 permit is **STAYED** and extended until June 30, 2016."

6.2.1 Impervious Area Reduction Efforts Countywide

Frederick County submits the attached Impervious Surface Area Assessment in accordance with Part IV.E.2.a of our MS4 Discharge permit. This Assessment is based on the MS4 Permit Area established in Part I.B of the permit. However, the County makes no representations by submittal of this Assessment that 20% of the acreage identified can be restored in the manner provided in Part IV.E.2.a. considering

the County's financial capability and the short timeframe specified in Part IV.E.2.a for that magnitude of work, which the County maintains exceeds the legally-authorized "maximum extent practicable" level of effort for the term of the permit. This Assessment is subject to future refinement by the County based on new or additional information.

As a requirement of section PART IV.E.2.a of the NPDES MS4 Discharge Permit issued by MDE to Frederick County, the County must conduct an impervious area assessment to define the restoration efforts required under the permit and treat 20% of remaining Countywide baseline untreated impervious acres by 2019, the end of the current permit. To determine the County's Impervious Restoration goals that following processes were performed

- Determined the County's MS4 Boundary
    - Added all County owned roads and drainage areas owned by the County or that drain to or from roads in municipalities
    - Included all County owned properties
    - Excluded all state and federal properties cover by General Permit # 05-SF-5501/MDR 055501.
    - Also excluded all stormwater industrial permit holders (12-SW, 12-SR, 12-NE).
- Impervious Capture
    - Captured all impervious data that within the MS4 defined captured area.
- Existing BMPs
    - Used a Treatment by Era approach to base treatment amount on type and era to determine the level of water quality treatment provided.
- Impervious Surfaces in Rural Areas
    - Estimating treatment from rooftop disconnect, non-rooftop disconnect, and sheetflow to conservation areas

6.2.2 Restoration Projects by Type

A list of restoration projects will be provided as part of the restoration plan requirement under Part IV.E.2.b of the permit and is stayed until June 30, 2016.

6.2.3 Implementation Strategy and Timeline

This requirement is to be submitted as part of the restoration plan requirement under Part IV.E.2.b of the permit and is stayed until June 30, 2016.

6.3 Public Participation

As required by Part IV.E.3 of the MDE NPDES MS4 Discharge Permit, public participation is required for Frederick County's watershed assessments and restoration plans. The specific requirements include:

1. Notice in a local newspaper indicating a 30-day public comment period for each watershed assessment and restoration plan,
2. Notice in a local newspaper announcing that public information procedures are provided on the County's website for each watershed assessment and restoration plan, and
3. A summary in the Annual Report on public participation activities for each of the watershed assessments and restoration plans.

Frederick County has several assessments currently in progress and will encourage public participation once the final drafts are received. The final drafts of the following assessments are expected in 2016:

- Upper Monocacy Watershed Assessment
- Lower Monocacy Watershed Assessment
- Ballenger Creek Stormwater Master Plan
- Little Hunting Creek Drainage Study, and
- The TMDL restoration plan.

In addition, Frederick County completed an assessment for watershed restoration opportunities in the point of rocks neighborhood. The area studied is located within the Potomac Direct watershed, catchment area F and is an established residential neighborhood primarily developed prior to 1990. An unnamed tributary to the Potomac River conveys the majority of runoff from the neighborhood drainage area into a stormwater management pond. This area has experienced significant erosion from high water volume in recent years. Frederick County held three public information meetings for the residents of the neighborhood to solicit comments and feedback on the proposed restoration projects (i.e., stream restoration, pond retrofit and several roadside bioretention facilities). The meetings were held on October 25, 2012, May 22, 2013, and October 29, 2014 to engage the community throughout the process. The assessment Report is also published on the County's website.

6.4 TMDL Compliance

The following sections present the methodology and resultant values for baseline, target, permit, and current loads presented in the following table in the MDE_NPDES_MS4 geodatabase: CountywideStormwaterWatershedAssessment.

6.4.1 Local TMDL Requirements

As discussed in Section 6.2 Restoration Plans, there are currently 12 final approved TMDLs within Frederick County with SW-WLAs. In order to derive the County MS4-specific SW-WLA load reduction targets, MDE's published baseline values for each TMDL need to be *disaggregated* and *calibrated* before the percent reduction is applied to calculate the load reduction required. The two procedures are described below.

Disaggregation

Some SW-WLAs are developed by MDE as an aggregate load including load contributions from multiple jurisdictions. Aggregate values must be first disaggregated to determine the portion of the load that each jurisdiction is responsible for. To date, Frederick County is responsible for seven aggregate WLAs and five individual WLAs. There are two methods used in the annual report for disaggregating loads; the first method uses the proportion of County urban land to total urban land in the watershed to partition out the County's baseline load. The second disaggregation method uses the BayFAST (Bay Facility Assessment Scenario Tool) model to calculate the baseline load.

Calibration

Frederick County's TMDLs were developed by MDE at different periods in time using a variety of models. In order to use current models such as MAST (Maryland Assessment Scenario Tool), which is based on the current version of the Chesapeake Bay Model (v5.3.2), for analysis of load reductions, the baseline load needs to be translated or "calibrated" from the model used to develop the TMDL to the current model.

According to the MDE guidance document *Guidance for Using the Maryland Assessment Scenario Tool to Develop Stormwater Wasteload Allocation Implementation Plans for Local Nitrogen, Phosphorus, and Sediment TMDLs* (MDE, 2014), Section I, baseline nutrient and sediment loads and SW-WLAs must be calibrated to the model used to calculate load reductions:

Because all of Maryland's approved local nutrient and sediment TMDLs were developed using watershed models other than MAST [Maryland Assessment Scenario Tool], the baseline and target loads from these TMDLs need to be translated into MAST loadings. This adjustment is required to account for potential differences between models. This is a two-step process that involves 1) creating a MAST scenario that replicates the baseline year of the TMDL, and 2) applying the load reduction percentage from the TMDL to the MAST loading for the baseline year.

Bacteria Baseline Loads and SW-WLAs

Bacteria load reductions are not modeled using BayFAST or MAST, therefore aggregate bacteria SW-WLAs were disaggregated but did not require calibration. The aggregate SW-WLA for the County's bacteria TMDLs were disaggregated following steps outlined in MDE's TMDL Stormwater Toolkit (MDE, 2015b). In order to determine Frederick County's portion of the load, the aggregate SW-WLA must be disaggregated based on the percentage of Frederick County's MS4 regulated urban land area within the TMDL watershed. The proportion of Frederick County MS4 urban land area to total urban land area, including other jurisdictions, within the 8-digit watershed boundaries was calculated. Urban land use categories from Maryland Department of Planning 2010 land use data (MDP, 2010) were used to define each jurisdiction's urban area. The percentage of Frederick County MS4 urban land area was then applied to the aggregate SW-WLA published in the local TMDL document. Local TMDLs with individual SW-WLAs require a specified percent reduction of pollutant loads from baseline levels to achieve the target SW-WLA and no disaggregation is necessary. Table 12 displays Frederick County local TMDLs with SW-WLAs disaggregated.

The load reductions calculated from disaggregating the aggregate bacteria SW-WLAs following MDE guidance stated above will be the target used for TMDL compliance. These values are presented in bold in the Calculated Disaggregated County MS4 Reduction column of Table 12. The disaggregation and calibration of load reduction targets for the phosphorus and sediment SW-WLAs is discussed in the following section.

Bacteria results listed in columns **Calculated Disaggregated County MS4 WLA** and **Calculated Disaggregated County MS4 Baseline Load** are presented in the fields **TARGET_LOAD** and **BASELINE_LOAD**, respectively, in the MDE_NPDES_MS4 geodatabase table LocalStormwaterWatershedAssessment.

Disaggregating and Calibrating Nutrient and Sediment Baseline Loads and SW-WLAs

Local TMDL baseline loads for nutrients and sediments were disaggregated and calibrated in BayFAST. BayFAST allows users to specify the watershed and jurisdiction to model; therefore, the results include only Frederick County MS4 baseline loads and do not include other municipalities. The results then represent the disaggregated portion of the baseline load.

The baseline model includes County BMPs installed prior to the TMDL baseline year on top of baseline land use background loads. BayFAST functions similarly to MAST; however, BayFAST allows users to delineate facility boundaries (e.g., watershed, parcel, drainage area) and alter land use information within the delineated boundary depending on the model year. The general calibration procedure is as follows:

1. For each local TMDL, a facility boundary for the 8-digit TMDL watershed within Frederick County borders was delineated within BayFAST.
2. All default land use acreages were deleted and regulated pervious and impervious acres were replaced with MAST Local Base County Phase I MS4 urban pervious and impervious acres using the Compare Scenario tool in MAST for the respective baseline year for each local TMDL. This approach inherently disaggregates County MS4 loads from the rest of the NPDES regulated area within the watershed.
3. County BMPs installed prior to the TMDL baseline year were then added to the model.
4. The reduction percentage published in the TMDL document was then applied to the calibrated baseline loads modeled in BayFAST to calculate a calibrated reduction in EOS-lbs/yr.
5. A calibrated SW-WLA was calculated by subtracting the calibrated reduction from the BayFAST baseline load.

Table 13 displays Frederick County nutrient and sediment local TMDLs with baseline loads and SW-WLAs calibrated to BayFAST.

Calibrated load reductions calculated based on TMDL percent reductions and baseline loads modeled in BayFAST using Frederick County Phase I MS4 baseline pervious and impervious land use and baseline treatment will be the target reductions used for TMDL compliance for nutrient and sediment local TMDLs. These values are presented in bold in the Calibrated Reduction column of Table 13.

Phosphorus and sediment results listed in columns **Calibrated WLA** and **Calibrated Baseline Load** are presented in the fields **TARGET_LOAD** and **BASELINE_LOAD**, respectively, in the MDE_NPDES_MS4 geodatabase table LocalStormwaterWatershedAssessment.

Table 12 - Frederick County Local TMDLs with SW-WLAs. Aggregate SW-WLAs Disaggregated Following MDE Guidance

Watershed Name	Watershed Number	WLA Type	Baseline Year	Baseline Model[1]	Pollutant	Units	MDE Published WLA[2]	MDE Published Reduction %[2]	8-digit Watershed Frederick County MS4 Urban Land Area (ac)[3]	8-digit Watershed TOTAL NPDES Land Area (ac)[4]	% of County MS4 Land Area[5]	Calculated Disag-gregated County MS4 WLA[6]	Calculated Disag-gregated County MS4 Reduction[7]	Calculated Disag-gregated County MS4 Baseline Load[8]
Catoctin Creek	02140305	Individual	2009	CBP WM P5.3.2	Phosphorus	Lbs/yr	7,374.0	11.0%	-	-	-	-	-	-
		Aggregate	2000	CBP WM P5	Sediment	Tons/yr	1,392.0	49.1%	16,823.1	18,729.6	90%	1,250.3	1,206.1	2,456.4
Double Pipe Creek	02140304	Individual	2009	CBP WM P5.3.2	Phosphorus	Lbs/yr	301.0	73.0%	-	-	-	-	-	-
		Aggregate	2000	CBP WM P5	Sediment	Tons/yr	228.9	46.8%				19.0	16.7	35.7
		Aggregate	2004	N/A	E. coli	Billion MPN/yr	23,884.0	98.8%	2,042.0	24,612.0	8%	1,981.6	**163,151.1**	165,132.7
Lower Monocacy River[9,10]	02140302	Individual	2009	CBP WM P5.3.2	Phosphorus	Lbs/yr	22,766.0	28.0%	-	-	-	-	-	-
		Aggregate	2000	CBP WM P5	Sediment	Tons/yr	3,157.9	60.8%				2,190.5	3,397.5	5,588.0
		Aggregate	2004	N/A	E. coli	Billion MPN/yr	183,893.0	92.5%	40,336.0	58,149.5	69%	127,559.2	**1,573,230.4**	1,700,789.7
Potomac River Montgomery County	02140202	Individual	2005	CBP WM P5.2	Sediment	Tons/yr	1.5	36.2%	-	-	-	-	-	-
Upper Monocacy River	02140303	Individual	2009	CBP WM P5.3.2	Phosphorus	Lbs/yr	7,131.0	4.0%	-	-	-	-	-	-
		Aggregate	2000	CBP WM P5	Sediment	Tons/yr	1,770.0	49.0%				1,213.8	1,166.2	2,379.9
		Aggregate	2004	N/A	E. coli	Billion MPN/yr	37,961.0	97.0%	17,519.6	25,548.6	69%	26,031.3	**841,679.4**	867,710.8

Target load reductions used for TMDL compliance shown in bold text.
SW-WLA disaggregation method: MDE TMDL Stormwater Toolkit (http://www.mde.state.md.us/programs/Water/TMDL/DataCenter/Pages/TMDLStormwaterToolkit.aspx)

1) Baseline model used to create the TMDL. Chesapeake Bay Program Watershed Model Phase (CBP WM P). To calculate bacteria baseline loads, a flow duration curve approach was employed, using flow strata estimated from USGS daily flow monitoring data and bacteria monitoring data.
2) Published WLA and Reduction % from the MDE TMDL Data Center SW WLAs for County Storm Sewer Systems in Frederick County
3) MDP 2010 LULC urban land area within Frederick County NPDES MS4 Phase I/II source sector in watershed.
4) MDP 2010 LULC urban land area within total NPDES source sectors in watershed.
5) The percent of County MS4 land area was calculated by dividing the total County MS4 urban land area with the total urban NPDES source sector land area of the 8-digit watershed area (MDP, 2010).
6) Disaggregated WLAs were calculated by multiplying MDE published aggregate WLAs by the percentage of County MS4 land within the urban NPDES land area of the 8-digit watershed.
7) Disaggregated reductions were calculated from the disaggregate WLA and reduction % using the following equation: (Disaggregated WLA / (1 - Reduction %)) - Disaggregated WLA
8) Disaggregated baseline loads were calculated by adding the disaggregate WLA and reduction loads.
9) The Lake Linganore watershed is listed under a separate phosphorus and sediment TMDL and is not included in this analysis.
10) Lake Linganore BMPs are not included in Lower Monocacy. These BMPs will be included if a Lake Linganore Frederick County SW-WLA is required.

Table 13 - Calibrated Nutrient and Sediment Local TMDL SW-WLAs and Target Load Reductions

Watershed Name	Watershed Number	Baseline Year	Pollutant	MDE Published Reduction %[1]	Baseline Acres (MAST Local TMDL Base Year)[2]		Calibrated Baseline Load EOS-lbs/yr[3]	Calibrated Reduction EOS-lbs/yr[4]	Calibrated WLA EOS-lbs/yr[5]
					County Phase I MS4 Impervious	County Phase I MS4 Pervious			
Catoctin Creek	02140305	2009	Phosphorus	11.0%	1,301.00	6,352.70	7,787.20	**856.59**	6,930.61
		2000	Sediment	49.1%	1,214.90	5,715.50	4,653,075.00	**2,284,659.83**	2,368,415.20
Double Pipe Creek	02140304	2009	Phosphorus	73.0%	240.90	1,186.40	1,350.70	**986.01**	364.68
		2000	Sediment	46.8%	152.50	833.50	505,282.30	**236,472.12**	268,810.18
Lower Monocacy River[6]	02140302	2009	Phosphorus	28.0%	5,715.70	26,120.00	28,358.30	**7,940.32**	20,417.98
		2000	Sediment	60.8%	4,516.90	20,214.00	9,843,363.00	**5,984,764.70**	3,858,598.30
Potomac River Montgomery County	02140202	2005	Sediment	36.2%	10.20	45.80	32,041.20	**11,598.91**	20,442.29
Upper Monocacy River	02140303	2009	Phosphorus	4.0%	879.20	6,653.80	6,386.50	**255.46**	6,131.04
		2000	Sediment	49.0%	764.40	5,434.00	2,376,268.00	**1,164,371.32**	1,211,896.70

Target reduction loads used for TMDL compliance shown in bold text.

1) Published Reduction % from the MDE TMDL Data Center SW WLAs for County Storm Sewer Systems in Frederick County
2) County Phase I MS4 urban impervious and pervious acres for the TMDL baseline year. A query was run using the MAST Compare Scenario tool based on local TMDL watershed split by County and Local Base year.
3) Baseline loads modeled in BayFAST using County BMPs installed prior to the TMDL baseline year on top of baseline land use background loads.
4) Calibrated reductions calculated by applying the MDE published percent reduction to the BayFAST calibrated baseline loads.
5) Calibrated WLAs calculated by subtracting the calibrated reduction from the BayFAST calibrated baseline load.
6) The Lake Linganore watershed is listed under a separate phosphorus and sediment TMDL and is not included in this analysis.

6.4.2 Bay TMDL

The Chesapeake Bay TMDL, established by the EPA (EPA, 2010), sets pollution limits for nitrogen, phosphorus, and sediment in the Chesapeake Bay Watershed. This TMDL, required under the Clean Water Act, was in response to the slow progress by states within the watershed to limit their pollutants to levels which meet water quality standards in the Bay and its tidal tributaries. Total limits set in the Bay TMDL for the states of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia are "185.9 million pounds of nitrogen, 12.5 million pounds of phosphorus and 6.45 billion pounds of sediment per year—a 25 percent reduction in nitrogen, 24 percent reduction in phosphorus and 20 percent reduction in sediment" (EPA, 2010). The TMDL also sets "rigorous accountability measures" for state compliance.

While not a requirement in the County's MS4 permit, restoration strategies to meet local TMDL reduction targets and impervious restoration treatment were also modeled against the Bay TMDL goals in order to calculate progress. The County's MS4 permit is requiring compliance with the Chesapeake Bay TMDL through the use of the 20% impervious surface treatment strategy as described in greater detail in the following section.

Table 14 provides a concise summary of Frederick County's portions of target edge of stream (EOS) and delivered (DEL) reductions towards the Chesapeake Bay TMDL and 2010 baseline and 2025 allocated loads. Countywide results listed in rows **Calibrated 2010 Baseline Load** and **Calibrated Bay TMDL WLA** are presented in the fields **BASELINE_LOAD** and **TARGET_LOAD**, respectively, in the MDE_NPDES_MS4 geodatabase table CountywideStormwaterWatershedAssessment.

- **TN, TP, TSS:** Total Nitrogen, Total Phosphorus, Total Suspended Sediment. As specified in the Bay TMDL, if the phosphorus target is met, the sediment target will be met.
- **EOS lbs/yr and DEL lbs/yr:** An EOS load is the amount of a pollutant load that is transported from a source to the nearest stream annually while a DEL load is the amount of a pollutant load that is transported to the tidal waters of the Chesapeake Bay annually. DEL loads are generally less than EOS loads due to losses during transport from streams to the Bay.
- **Calibrated 2010 Baseline Load**: Baseline levels (i.e., land use loads with baseline BMPs) from 2010 conditions in the Frederick County MS4 source sector using the Maryland Assessment Scenario Tool (MAST) Chesapeake Bay Program Phase 5.3.2 (CBP P5.3.2) model. Baseline loads were used to calibrate the Bay TMDL nitrogen and phosphorus SW-WLAs.
- **Target Percent Reduction**: Percent reductions assigned to Frederick County Phase I MS4 stormwater sector (http://wlat.mde.state.md.us/ByMS4.aspx). If TP target is met, TSS target will be met.
- **Calibrated Target Reduction:** Target reduction calibrated to MAST CBP v.5.3.2 by multiplying the reduction percent published by the 2010 baseline load. If TP target is met, TSS target will be met.
- **Calibrated TMDL WLA**: Allocated loads are calculated from the 2010 baseline levels, calibrated to CBP P5.3.2 as noted above, using the following calculation: 2010 Baseline – (2010 Baseline x Target Percent Reduction); or, 2010 Baseline x (1 – Target Percent Reduction).

Table 14 - Frederick County Chesapeake Bay TMDL Baseline and Target Loads

Baseline and Target	TN-EOS lbs/yr	TN-DEL lbs/yr	TP-EOS lbs/yr	TP-DEL lbs/yr	TSS-EOS lbs/yr	TSS-DEL lbs/yr
Calibrated 2010 Baseline Load	1,096,458.45	556,694.68	46,994.58	22,046.67		
Target Percent Reduction	10.2%	10.9%	20.7%	20.7%	-	-
Calibrated Target Reduction	111,838.76	60,679.72	9,727.88	4,563.66	-	-
Calibrated Bay TMDL WLA	984,619.69	496,015.00	37,266.70	17,483.01	-	-

6.4.3 Pollutant Loadings

As mentioned in Section 6.2, restoration plans will be completed at a later date. The results below present 2014 permit and 2015 current loads for nutrient and sediment listings. Bacteria loads will be addressed in the forthcoming restoration plans; therefore, permit and current bacteria loads are not presented in this annual report.

All County completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives through 12/30/2014 were modeled in MAST to calculate 2014 permit loads, while all treatment through 6/30/2015 were modeled to calculate 2015 current loads. Permit and current loads for nutrient and sediment local TMDLs are presented in Table 15 and in the MDE_NPDES_MS4 geodatabase table LocalStormwaterWatershedAssessment. Countywide permit and current loads are presented in Table 16 and in the MDE_NPDES_MS4 geodatabase table CountywideStormwaterWatershedAssessment.

Table 15 - Permit and Current Loads for Nutrient and Sediment Local TMDLs

Watershed Name	Watershed Number	Pollutant	Permit Load EOS-lbs/yr[1]	Current Load EOS-lbs/yr[2]
Catoctin Creek	02140305	Phosphorus	8,000.10	8,051.54
		Sediment	5,000,236.57	5,031,059.39
Double Pipe Creek	02140304	Phosphorus	1,356.58	1,357.63
		Sediment	801,594.26	802,191.53
Lower Monocacy River[3]	02140302	Phosphorus	22,346.49	22,812.44
		Sediment	8,144,468.88	8,327,660.55
Potomac River Montgomery County	02140202	Sediment	18,902.99	18,902.99
Upper Monocacy River	02140303	Phosphorus	7,281.24	7,515.7
		Sediment	3,351,522.88	3,485,191.83

1) Including treatment from County BMPs through 12/30/2014
2) Including treatment from County BMPs through 06/30/2015
3) The Lake Linganore watershed is listed under a separate phosphorus and sediment TMDL and is not included in this analysis because it is not listed in the TMDL data center. MDE SSA has indicated they want to reevaluate this TMDL.

Table 16 - Countywide Permit and Current Loads

Countywide Loads	TN-EOS lbs/yr	TN-DEL lbs/yr	TP-EOS lbs/yr	TP-DEL lbs/yr	TSS-EOS lbs/yr	TSS-DEL lbs/yr
Permit Load	1,184,612.29	604,566.95	50,930.10	23,892.99	23,441,570.42	15,187,636.66
Current Load	1,206,795.75	616,618.96	51,924.38	24,359.46	23,919,673.79	15,497,396.62

7 Assessment of Controls

7.1 Watershed Restoration Assessment

During the past year, Frederick County has worked on a number of initiatives to monitor, assess, protect, and restore watersheds. Appendix L provides monitoring and assessment results, and summarizes progress on County watershed protection and restoration efforts from January – June 2015.

7.1.1 Stream Monitoring to Identify and Evaluate Water Quality Problems

In 1999, Frederick County initiated its original stream monitoring program, the goal of which was to identify and evaluate water quality problems in its priority watersheds and subwatersheds by conducting, on a rotating basis, stream monitoring using both biological and physical habitat methods. Monitoring was conducted every two to three years in the County's three highest priority watersheds: Lower Bush Creek, Ballenger Creek, and Lower Linganore Creek. This continued until 2006.

In 2007, the County conducted a pilot program that would serve as the basis for a new approach to stream monitoring that would begin to look at stream health throughout the County. Sampling at randomly selected locations was performed in the Bennett Creek and Catoctin Creek watersheds. Lessons learned in this pilot project were then used to refine the study design for a County-wide stream program.

In 2008, the County officially redesigned its monitoring program to include two separate monitoring efforts: (1) targeted restoration monitoring and (2) County-wide, probability-based stream monitoring, with sites selected randomly and stratified by watershed. The targeted restoration monitoring effort for 2015 involved stream sampling in Bennett Creek, Fishing Creek, Hunting Creek, and Lower Linganore Creek, in support of on-going and potential future restoration and community outreach efforts (Section 1.2); restoration monitoring efforts from Lower Bush Creek in 2015 are presented in a separate report. In 2015, the County surveyed stream conditions at 10 targeted locations (Figure 1 1, Table 1-1). The second round of County-wide stream monitoring began in 2013 and continued through 2015; County-wide stream monitoring results will be presented in a later report.

7.1.2 Watershed Assessment and Restoration Overview

The county's targeted stream restoration monitoring program is an assessment of physical, chemical, and biological data, collected during designated index periods (Southerland et al. 1999, Morgan and Roth 2005). Year 2015 sampling included collection of water quality data, benthic macro invertebrate and fish sampling, and quantitative physical habitat assessment using MBSS habitat and geomorphic data collection methods. Biological and physical monitoring methods employed in this survey are the same as those listed in Table 1-2, and described in detail in the Quality Assurance Project Plan for Biological and Physical Monitoring in Peter Pan Run and Other Selected Watersheds (Morgan and Roth 2005). Key findings are summarized in Appendix L. The geomorphic data collected provide a follow-up to previous

surveys for existing stations, monitoring changes over time, in comparison with baseline data collected in the initial year. Cross-sections, established at each site in a previous sampling year, were re-surveyed in 2015. MBSS habitat evaluations performed during spring and summer sampling provide a scored assessment. Site locations and descriptions can be found in Figure 1-1 and Table 1-1, respectively; specific details and results pertaining to restoration monitoring in each watershed are provided in Sections 1.2.1 through 1.2.4 in Appendix L. Watershed restoration activities within each watershed are also documented in these sections.

Data for all monitoring activities is included in the in the MDE_NPDES_MS4 geodatabase in the following features and tables: MonitoringSite, MonitoringDrainageArea, ChemicalMonitoring, LocalConcern BiologicalMonitoring, NarrativeFiles.

7.2 Stormwater Management Assessment

A detailed report of the long-term monitoring occurring in the Peter Pan Run watershed was completed to meet the requirement of the County's NPDES permit. A complete report of the findings can be found in Appendix M.

8 Program Funding

Frederick County has consistently maintained adequate funding to support the requirements of the NPDES program through its Operating and CIP budgets. This section outlines expenditures from the first half of CY 2015 which is also the second half of FY 2015.

The Operating Budget requires annual requests, with approval granted from year-to-year. Funds from the Operating Budget generally do not carry over from year-to-year. The CIP Budget noted here, which is based solely on purchase orders cut in the first half of CY 2015, also requires an annual submission, with approval granted from year-to-year. Unlike Operating Budgets, submissions include projections for the next five out-years. During the first half of CY 2015, the County's overall NPDES funds total $3,491,502 in support of its NPDES program. Expenses on encumbrances are accounted for in the year they were spend and will not be counted twice.

More detailed information on budget allocations are reported in the table FiscalAnalyses in the MDE_NPDES_MS4 geodatabase.

Evaluation: Frederick County continues to maintain adequate funding to support its NPDES MS4 permit program. Adequate funding has been requested and maintained to meet NPDES requirements in both the Operating and Capital Budgets. Adequate funding enabled the Watershed Management Section to complete its NPDES requirements in full compliance. The County had allocated new funds for 2015 in preparation for the requirements of this new permit and to develop a pipeline of projects to increase capacity.

9 Special Programmatic Conditions

9.1 Bay TMDL

The Bay TMDL requirements are addressed previously in section 6, specifically in section 6.4.1 Bay TMDL.

Phase II is in place and the County will be working with MDE to coordinate Phase III WIPS that account for the 2017 updates.

9.2 Water Resources Element

The Board of County Commissioners formally adopted the complete Water Resources Element (WRE) technical document on September 23, 2010 (Frederick County, 2010). The WRE provides a detailed presentation of the County's water resources plus limitations and challenges to meeting future population needs. Wastewater treatment capacities and future projected treatment needs are also analyzed. The WRE is divided into three components: Drinking Water Assessment, Wastewater Assessment, and Managing Stormwater and Non-Point Source Pollution.

10 References

Frederick County. 2010. Water Resources Element – A Functional Element of the 2010 County Comprehensive Plan. Adopted September 23, 2010. Prepared by the Frederick County Division of Planning, Frederick, MD.

Maryland Department of the Environment (MDE). 2014. Guidance for Using the Maryland Assessment Scenario Tool to Develop Stormwater Wasteload Allocation Implementation Plans for Local Nitrogen, Phosphorus, and Sediment Total Maximum Daily Loads. Maryland Department of the Environment. June 2014. Baltimore, MD.

Maryland Department of the Environment (MDE). 2015. Stormwater Toolkit. http://www.mde.state.md.us/programs/Water/TMDL/DataCenter/Pages/TMDLStormwaterToolkit.aspx

Maryland Department of Planning (MDP). 2010. Land Use/Land Cover for Maryland. Maryland Department of Planning, Baltimore, MD.

United States Coast Guard National Response Center (USCG). 2015. 2015 Reports. http://www.nrc.uscg.mil/. Accessed on 10/30/2015.